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DEPARTMENT OF EDUCATION.

SCHOOL ARCHITECTURE.

PART II.

PLANS FOR GRADED SCHOOLS.

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SCHOOL ARCHITECTURE.

PART II.

PLANS FOR GRADED SCHOOLS.

PRELIMINARY REPORT.

THE following Illustrations of Buildings recently erected for Graded Schools in several of the principal cities of the country, are selected from a much larger number in possession of the Commissioner of Education, for many of which he is indebted to the Superintendents of Public Schools in these cities, who have in this way responded most promptly and liberally to his Circular (No. 9,) on the subject. A particular acknowledgment will be made in his full Report.

SCHOOL ARCHITECTURE.

PRELIMINARY REPORT.

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CIRCULAR RESPECTING SCHOOL ARCHITECTURE.

U. S. Department of Education,
Washington, D. C., 1867.

The following Circular is the substance of numerous letters which the Commissioner has already had occasion to write; and correspondents, to whom it may be addressed, will please receive it as specially addressed to them, in the way of answer, or of inquiry, on the points specified.

HENRY BARNARD, *Commissioner.*

A. No document explanatory of the principles of School Architecture, or illustrative of the present advanced practice in different States, has been published by the Department, but the Commissioner has been for years collecting the material for a comprehensive publication on the subject, to which any contribution in the way of suggestion or illustration will be duly acknowledged.

B. Information on any of the topics, and as far as practicable, impressions from any of the illustrations in the accompanying Classified Index, (XVIII,) will be promptly furnished without expense to committees engaged in preparing plans for school edifices.

C. The following Title and Contents will explain the nature of the document above referred to:

School-houses: Plans of Buildings recently erected for Educational Uses; with an Introduction on the Principles of School Architecture, and its Progressive Development in the United States. [A Document prepared for publication by the National Department of Education.]

CONTENTS.

Introduction.

1. Progressive Improvement and Present Condition of School-houses and their Equipment in the different States, drawn from official documents published from 1830 to 1840, and from 1865 to 1868.
2. General Principles to be observed in the Location, Grounds, Material, Construction, Lighting, Warming, Ventilation, and Furniture of Buildings designed for Educational Purposes.
3. Plans of School-houses recommended by Official Authorities, Educators and Architects in different countries.

Plans of Buildings designed for Educational Uses recently erected.

Part I. Unclassified Schools, or Schools with a single apartment, or at most two, in Rural Districts.

Part II. Graded Schools, or Schools with two or more classes, in Villages and large Cities.

Part III. Special Schools, such as Normal Schools, Scientific Schools, &c. &c.

Part IV. Collegiate Institutions, or Buildings in which Residence and Domestic Uses are provided for, as well as Class and Lecture Rooms, Library, Cabinets, Laboratory, Gymnastics, &c. &c.

Part V. Library, Museum, Lecture-hall, Gymnasium, &c.—buildings for a special purpose.

The Introduction, and each Part, will be paged and issued by itself, as soon as completed, and its publication is authorized.

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SCHOOL ARCHITECTURE.

PLANS FOR UNION AND GRADED SCHOOLS.

GRAMMAR SCHOOLS IN BOSTON.

In determining on the size, internal arrangements, and equipment of a School-house, regard must be had not only to the number of children to be accommodated, but to their age, studies, and classification, that is, to the character and aim of the school or schools to be provided for.

By a Union, or Graded School, was originally intended a school in which all the scholars of a given territory—usually a village, or other populous municipality—before accommodated in several small houses, were brought into one large building, and there distributed into different rooms, or grades according to attainments, so as to bring a large number of pupils of nearly the same age, and in a few and the same studies, under teachers having special qualifications for each grade—and especially to bring the young children by themselves under female teachers, and to facilitate the employment of the same class of teachers as assistants in schools designed for the older pupils. In the more populous districts the gradation was and still continues more minute, and by degrees, school-houses are now erected specially for at least three grades—although houses designed mainly for the youngest grade, embrace accommodations for the next highest, and houses designed for the oldest pupils and the highest grade not unfrequently include accommodation for the next lowest.

But in edifices designed for a particular grade, regard must be had in the internal arrangement to the different plan of classifying the school for the purposes of instruction and government—and particularly to this,—whether there shall be on each floor one large room, (or two, capable of being made into one when necessary,) where all the pupils shall be properly seated for study, supervision and general instruction under a principal teacher, with smaller room to which the several classes shall retire for purposes of recitation to assistants selected in reference to their special qualification in instruction; or whether the floor shall be divided into a certain number of rooms, each room to accommodate only as many pupils as can be profitably instructed by one and the same teacher—and each room to constitute a separate school, except that all are to be subject to the supervision, and, to some extent, the occasional visitation and instruction of the Principal teacher of the whole school.

In the Public Schools of Boston, the former plan prevailed generally in all the grammar schools—until the organization of the Quincy school in 1848. Since that date the size of the houses has been determined by the convenience of classifying the pupils into rooms, each capable of providing from fifty to sixty with separate desk and chair, and he school has been organized so as to have a special teacher for each room, all subordinate to the Principal—his room accommodating the same number of pupils, in which he is allowed an assistant, so as admit of his visiting from time to time the other rooms, or classes in the same building. There are many advantages in this arrangement, and under a Principal, disposed and at liberty by having assistants in his own room to make himself felt in government and instruction in each room—the disadvantages of not having all the pupils of the same school under the eye, voice and personal influence of the superior master, are in a measure obviated.

Plans of the Boston Latin School.

Before introducing plans of the more recently erected school-houses in Boston, we will go back to the oldest school in the country, and get a glimpse of one of the earliest structures—the oldest of which we have any visible representation,* erected for school purposes in New England—the modest structure in which Ezekiel Cheever was installed "sole master," on the 22d of December, 1670, in the presence of "the Hon. Governor Richard Billingham, Major General John Leverett, and other Magistrates of the Colony, the Elders of the Churches, and Selectmen of the Town of Boston" Here for thirty-five years he continued to sway "the rod of empire" over governors, judges, ministers, magistrates and merchants yet in their teens, and under his administration the first "free schoole," † the always famous Latin School of Boston, became, according to Prince, "the principal classical school of the British Colonies."

* For this vignette of Mr. Cheever's School-house, we are indebted to the Rev. Edward E. Hale.

"Cheever's school-house occupied land on the North side of School street, nearly opposite the present Horticultural Hall. It was large enough to contain one hundred and fifty pupils. At the present time, the east wall of the Stone Chapel stands on the site of the old building, which was removed, after much controversy, to make room for the building of the Chapel, in 1748. The outline of the old building, and some general sketch of its appearance appear on an old map of Boston, dated 1722, of which, a copy is now in possession of Mr. Pulsifer, of Boston On this map, every building was represented, on the spot it occupied, with some effort at precision. From this map Cheever's school-house is represented in this sketch. King's Chapel is drawn from a view of more pretensions, representing the whole town, from a point above the harbor, in 1744. In that view, unfortunately, Cheever's school-house does not appear. As King's Chapel was materially enlarged in 1710, it has been represented here as being, in Cheever's time, somewhat shorter than in the authority alluded to. In an early print, described by Dr. Greenwood, a crown was represented below its vane, which has, therefore, been placed there in this sketch."

Mr. Gould introduces into his notice of the controversy which attended the removal of the old school house, to make room for an enlargement of the church, the following impromptu epigram written by Joseph Green, Esqr., and sent to Mr. Lovell in the School, when it was announced that the town had agreed to grant permission to the proprietors of King's Chapel to take down the old house.

A fig for your learning: I tell you the Town,
To make the *church* larger, must pull the *school* down
Unluckily spoken, replied Master Birch—
Then *learning*, I fear, stops the growth of the *Church*.

† For a brief exposition of the early "Free School" of Massachusetts, and of New England generally, and for all that can now be gathered of the personal history of Master Cheever, See American Journal of Education, Vol. XII., p. 529-560.

In 1748, the modest structure which had accommodated the Latin School and the family of Master Cheever, was removed to make room for the enlargement of the Stone Chapel, and a new and larger building erected on the opposite side of the same street, the third floor of which only was used for school purposes until 1816, when the increased number of pupils under Master Gould, called for the use of the second floor, which had been used by the Central Grammar School. For several years prior to Mr. Gould's appointment to the mastership, the Latin School did not keep up with the demands of the wealthy and educated families of the city who had generally got into the way of sending their sons into the country towns, and particularly to the academies at Exeter and Andover, to be prepared for admission to college and their withdrawal thus perhaps contributed largely to keep the school in an unprogressive state—taking from it both the pupils and the parental interest and intelligence, which are the life of every public school. The vigorous administration, personal popularity, and better scholarship of Mr. Gould, with the increasing interest in the improvement of the public schools generally, placed its course of instruction in extent and thoroughness on a level with the best academies of the country towns, and made it the natural head of the public schools of the city. With an improvement in the classical course destined for college, there grew up a demand for a more thorough literary and scientific training for boys who were destined for other pursuits than those of law, theology, and medicine, which found their appropriate preparation in the College—and the English High School was established in 1821, to meet this demand. The establishment of the English High School for boys, very naturally created a desire for similar advantages for the girls, which led to the establishment of the Girls' High School, in 1825, which in its turn gave way to an extension of the studies and a prolonged attendance of the girls in all the Grammar Schools in 1829. The discussion and final recognition of the necessity of special preparation for the art of teaching in connection with the employment of a large number of females as teachers in the Primary and Grammar Schools of the city, led to the establishment of a Normal School for girls, in 1852, which, in a few years, became also a High School for the same class of pupils, and thus the System of Public Schools in Boston, rises from the broad basis of Primary Schools, through its natural expansion of Intermediate and Grammar Schools into the Latin, English, and Girls' High Schools, and a Normal Course in the latter for at least the largest number of teachers—the female teachers of the city.

LATIN AND ENGLISH HIGH SCHOOL-HOUSE, BOSTON. Erected, 1844.

In the School-house on BEDFORD STREET, erected in 1843–4, for the Latin and English High Schools, the former is accommodated in the Hall H, and Class-rooms, C, C, C, C, on the left side, and the latter in the Hall and Class-rooms on the other side.

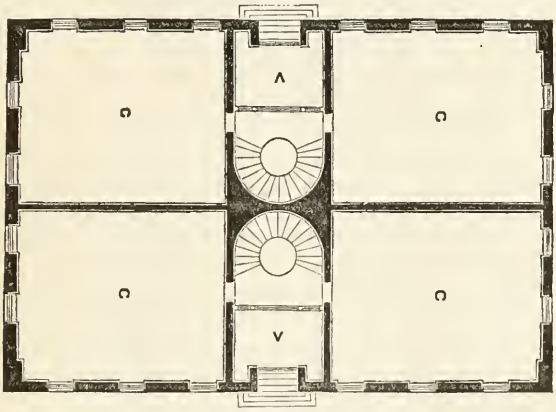


Fig. 1.—FIRST FLOOR.

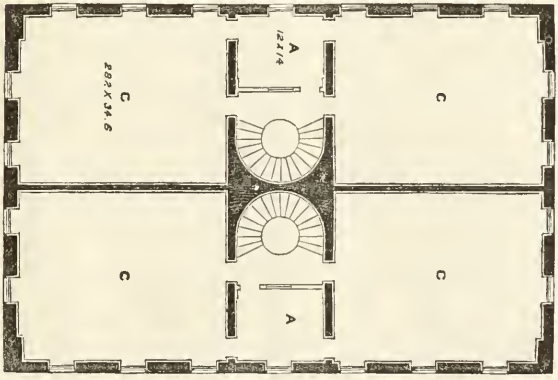


Fig. 2.—SECOND FLOOR.

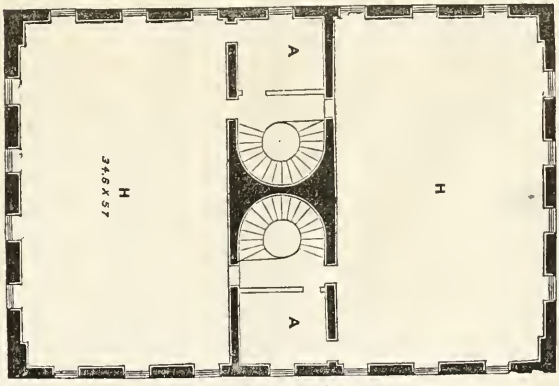


Fig. 3.—THIRD FLOOR.

Plans of Boston Grammar School-houses.

BY HON. JOHN D. PHILBRICK, SUPERINTENDENT OF PUBLIC SCHOOLS.

Before describing our latest school edifice (the Norcross Grammar School-house, in South Boston, completed and dedicated March 10, 1868), which embodies in design, construction, and equipment, several excellent features, not found in any one of its predecessors, it may be desirable to note the successive modifications which have been introduced into buildings for this class of schools.

The Boston Grammar School-house of forty years ago, was a two story edifice, each story containing one hall or school-room, with seats for about one hundred and eighty pupils. These halls were wholly destitute of such appendages or conveniences as recitation rooms, clothes-rooms, closets, and blackboards. In each of these large rooms there were usually three teachers, and their recitations had to be carried on at the same time, while the pupils not occupied in reciting were expected to close their ears to the surrounding din, and attend to their tasks. Of this type was the old Mayhew School-house, which continued to be occupied until 1846.

The first modification of this type consisted chiefly in the addition of a third story, the two upper stories being appropriated to the two halls as before, and the lower story to a ward-room or to Primary Schools. An illustration of this modified type is found in the Wells School-house, a cut of which Mr. Mann introduced into his Report on School-houses, as the best City Grammar School-house in 1838. It was subsequently remodelled, and is just now being replaced by a structure of the Norcross type. There was, of course, some improvement in respect to style of finishing and furnishing, but no new feature of importance added. The first important steps of progress consisted in the addition of two recitation rooms of moderate dimensions to each of the two large school-rooms or halls. This was instituted about the year 1840, and from this time until 1848, the recitation rooms were embraced in all the plans for new buildings, and most of the old buildings were enlarged for the purpose of securing these much needed conveniences. The Brimmer School-house, erected in 1843, was an example of this improvement. Recently it has been remodelled and enlarged.

In 1848, the Quincy School-house was erected, a description of which is contained in Barnard's School Architecture. This building was not, properly speaking, a modification of what had preceded it, either here or elsewhere. *It was a* NEW *type*. Its main features were these.

1. It was large. Up to this time, a Grammar School containing four hundred pupils was considered very large. This building had six hundred and sixty seats in its school-rooms, exclusive of the hall.

2. It contained a separate school-room for each teacher, twelve in all, and, of course, recitation rooms were not needed.

3. It contained a hall large enough to seat comfortably, all the pupils that could be accommodated in the school-rooms, and even more.

4. It contained a clothes-room attached to each school-room, through which the *pupils* passed in entering and leaving their respective rooms.

5. It contained a separate desk and chair for each pupil. This was probably the first Grammar School-house into which this feature was introduced.

All the Grammar School-houses which have been built in this city during the past twenty years, have been of this type. Modifications more or less important have from time to time been introduced, but the *type has not been changed.* The chief modification of this type which has been made in the plans of the buildings erected during the past fifteen years, consisted in increasing the number of school-rooms to fourteen by cutting off about two-fifths of the size of the hall for this purpose. This modification, so far from being an improvement, was undoubtedly a retrograde step. The rooms thus gained were too near the sky for ordinary school purposes, the hall was rendered too small in proportion to the size of the school, and the number of school-rooms was too great for a single Grammar School, containing one series of grades. The Prescott Grammar School-house, erected two years ago, a description of which may be found in Barnard's Journal of Education, Vol. XVI., is an improvement on the *modified* Quincy type which had been in vogue for some years, inasmuch as it is only *three* stories high, and has a sufficiently spacious hall. It is a noble edifice, but it is too large, having *sixteen* school-rooms, and the plan is more costly in proportion to the accommodations than that of any other building which has been built in this city.

The Superintendent of Schools, in a report submitted to the School Board in 1867, set forth his objections to the buildings which he calls *modifications of the Quincy type*, and advocated the adoption of a plan for a Grammar School-house, as a model or standard, which should provide for only three stories, and only *ten* school rooms, with a hall spacious enough to seat comfortably all the pupils that the ten school-rooms would accommodate.

In determining the plan of the Norcross building, the Superintendent's recommendation was considered, but not adopted in full. The Committee on Public Buildings of the City Council who really had all the *power* to decide what the plan should be, concluded to adopt a plan which may be called a compromise between that of the modified Quincy and that recommended by the Superintendent. The improvements on the Quincy type consist in its architectural character, in its style of finish, in its heating and ventilating apparatus, and in some minor details, especially for security against fire.

[Before giving Mr. Philbrick's description of the Norcross School-house, we will introduce the plans of the houses above referred to, with descriptions written at the time of their completion, to mark the successive modifications of this class of houses, together with statistics and remarks in the dedicatory exercises, to show the interest taken in their Public Schools by the most eminent citizens of Boston. H. B.]

SCHOOL-HOUSES CONVERTED INTO MONUMENTS OF PUBLIC SERVICE.

The practice begins to prevail of distinguishing the public schools of different localities of the same city by naming them after individuals who may happen to hold office at the time of instituting the school, or erecting the building, or, which we deem far better, after some of those noble men who, in the infancy of the state, laid the foundations of its prosperity by providing for the education of the whole people. In no way can their names pass so universally into the household words of a community. We select two beautiful instances of well-deserved commemoration of this kind.

WINTHROP SCHOOL-HOUSE, BOSTON.

The spacious, commodious, and elegant school-house recently erected in Boston, at an expense, including the site, of $90,000, was dedicated with appropriate exercises, and called after the name of the first Governor of Massachusetts,—the WINTHROP SCHOOL-HOUSE. Hon. Robert C. Winthrop, a lineal and worthy descendant of John Winthrop, made an address on the occasion, substantially as follows:—

I need not say that I have felt something more than a common interest in this scene. As a mere citizen of Boston, born upon her soil, educated in her public schools, and bound to her by a thousand ties of affection and gratitude, which no time can sever, I should, indeed, have found abundant reason for gratification and for pride in seeing her engaged, in the person of her chief magistrate, in dedicating so spacious and noble an edifice to the cause of popular education. As a humble but sincere friend to free government and republican liberty, too, I could not have failed to rejoice at beholding another buttress added to the bulwarks which are to save them from overthrow and downfall. For, my friends, it cannot be too often repeated, trite and common-place as it may sound, that these free institutions of ours can rest securely on no other basis than that of intelligence and virtue; and that intelligence and virtue can be disseminated and inculcated by no other agencies than the school and the church. Our school-houses and churches—these are the true towers and bulwarks of a republic, and the only standing army of freedom is that innumerable host of children who are in process of being trained up, in our sabbath schools and our week-day schools, in the fear of God, in the love of their neighbor, and in the elements of all useful knowledge and all sound learning.* It may well be a subject for joy, then, to every patriotic heart,—and I hope mine is one,—to see our cities and towns vying with each other, not like those of the old world, in the sumptuousness of their private mansions, or the magnificence of their government halls, but in the elegance and spaciousness and completeness of their common school-houses.

But, my friends, it would be affectation in me to conceal that I have another and peculiar interest in this occasion. I am sure that I need feel no delicacy in speaking of the distinguished person in whose honor this school has been primarily named. Five entire generations have now intervened between him and myself. More than two hundred years,—a long time in your little calendar, my young friends,—have passed away since he was laid beneath the sod in what is now King's Chapel Burying Ground, within a few feet of the City Hall, where a humble tomb-stone may be seen, bearing the inscription "John Winthrop, 1649." my relation to him, though direct, is thus almost too remote to subject anything I may say of him to the imputation of being dictated by any mere partiality or family pride. His name, too, is an historical name, upon which the judgment of the world has long ago been irrevocably pronounced.

Coming over here in 1630, as the leader and Governor of the Massachusetts

*On another occasion Mr. Winthrop characterized our public schools thus: "Other nations may boast of their magnificent gems and monster diamonds. Our Kohinoor is our Common School System. This is our "mountain of light,"—not snatched, indeed, as a prize from a barbarous foe, nor destined to deck a royal brow, or to irradiate a Crystal Palace, but whose pure and penetrating ray illumines every brow, and enlightens every mind, and cheers every heart and every hearthstone in the land, and which supplies, from its exhaustless mines, a ornaments of grace unto the head, and chains upon the neck "of every son and daughter of Massachusetts."

Company, with their Charter in his hand, he was identified, perhaps beyond all other men, at once with the foundation of our Commonwealth and of our city. And there is not a page of our Colonial Records, or of our Town Records, during the nineteen years of his living here, which does not bear testimony to his labors and his zeal for the public service. The very first entry in the records of Boston, if I mistake not, was in the handwriting, still extant, of John Winthrop. The first voluntary subscription for the support of Free Schools, in 1636, bore his name, as one of the three equal and largest contributors. The first statute for the establishment of a system of Education in New England, was passed under his auspices as Governor of the Commonwealth. The neighboring Common, the pride of our city, the play-place of our children, the source of so much health and happiness to us all, was originally laid out while he was at the head of the old Town Government, and by a Committee of which he was Chairman. The evidences of his services and of his sacrifices might be multiplied on every side. He spent his whole strength and his whole substance in the service of the infant Colony, and died, at last, a poor man; poor in everything but that good name which is above all price.

But, it is not so much what he did as what he was, that entitles him to the grateful remembrance of the sons and daughters of Boston, and of Massachusetts. He was a man of the purest life, of the sternest integrity, of the loftiest moral and religious principle; and, he has left an example of moderation and magnanimity, of virtue and piety, second to none which can be found in the annals of our country. His residence was near the site of the old South Church,—his garden, I believe, including the land upon which that venerated edifice now stands,—and it would scarcely be too much to say, that the atmosphere within those hallowed walls, purified as it is by the weekly prayers and praises of a thousand worshippers, is hardly more pure than when it was the atmosphere of John Winthrop's mansion.

I know not how, Mr. Mayor, I can do anything more appropriate to this occasion, or furnish any more striking illustration of the principles of him whose name has been inscribed upon these walls, than to read you a few brief sentences from one of his own letters. The letter is dated on the 16th of October, 1622, and was addressed to his eldest son, then a lad of 16 years old, who was pursuing his studies at Trinity College, Dublin. It furnishes ample proof that the writer was not a man to be satisfied with any mere intellectual education; but, that his first care was for the moral and religious instruction of the young.

"*My dearly beloved Son:*—I do usually begin and end my letters with that which I would have the *alpha* and *omega* of all thy thoughts and endeavors, viz.: the blessing of the Almighty to be upon thee,—not after the common valuation of God's blessings, like the warming of the Sun to a hale, stirring body,—but that blessing which faith finds in the sweet promises of God and his free favor, whereby the soul hath a place of joy and refuge in all storms of adversity. I beseech the Lord to open thine eyes, that thou mayest see the riches of His grace, which will abate the account of all earthly vanities; and, if it please Him to give thee once a taste of the sweetness of the true wisdom, which is from above, it will season thy studies, and give a new temper to thy soul. Remember, therefore, what the wisest saith, The fear of the Lord is the beginning of wisdom. Lay this foundation, and thou shalt be wise indeed."

Such was the career, and such the character of Governor Winthrop, and I need add nothing more, I am persuaded, to show that his name is worthy of being given to your school. And now, my young friends, it is for you, in your turn, to decide whether the school shall be worthy of the name. No names, however distinguished; no buildings, however convenient or costly; no committees, however enlightened and vigilant; no instructors, however accomplished and devoted, can make a good school, without the hearty coöperation, and willing compliance, and faithful study of the scholars. Let me conclude, then, by expressing the hope that you will not be unmindful of your opportunities, that you will not be unmindful of the example of him by whose name you are to be designated; and that, by your diligence, your good conduct, your fidelity to your duties, your reverence for the laws of God and of man, and your observance of the lessons of your instructors, you may strive to render the Winthrop School as much a model school in its internal condition and discipline, as it certainly seems to be in its external structure and arrangement. And, may the blessing of Heaven be upon your efforts!

Plan and Description of Bowdoin Grammar School-House.

The new Bowdoin School-house, completed in 1848, is situated on Myrtle street, and with the yard occupies an area of about 75 feet by 68 feet, bounded on each of the four sides by a street. It is built of brick with a basement story of hammered granite, and measures 75 feet 9 inches extreme length by 54 feet 6 inches extreme breadth—having three stories, the first and second being 13 feet, and the third, 15 feet high in the clear. The ground descends rapidly from Myrtle street, thereby securing a basement of 15 feet in the rear. One third of which is finished into entries, or occupied by three furnaces, coal bins, pumps, &c., and the remaining two thirds is open to the yard, thereby affording a covered play-ground for the pupils.

The third story is finished into one hall 72 feet long by 38 feet wide, with seats and desks for 180 pupils. On the south side of this hall there are two recitation rooms, each 16 feet by 12 feet, and a room for a library, &c. There are three rooms of the same size on the two floors below.

The second story is divided into two rooms by a partition wall, each of which is 35 feet by 38, and accommodates 90 pupils, and so connected by sliding doors that all the pupils of both schools can be brought under the eye and voice of the teacher.

The first story corresponds to the second, except there are no sliding doors in the partition, and no connection between the room except through the front entry. The two rooms on this floor have each seats and desks for 100 pupils.

Each story is thoroughly ventilated, and warmed by one of Chilson's Furnaces. In each furnace the air chambers, the apertures for conducting the cold air into them, and the flues for constructing the heated air into the rooms in each story, being all large, a great quantity of warm air is constantly rushing into the rooms, and the ventilating flues or ventiducts being so constructed and arranged that the air of the rooms will be frequently changed, and that a pure and healthy atmosphere will at all times be found in each of these rooms, provided the furnaces are properly and judiciously managed. On the top of the building there are two of Emerson's large ventilators, connected with the attic and ventilating flues, through which the impure air passes out into the atmosphere above.

To accommodate pupils who come to school with wet feet or clothes, there is an open fire in a grate in one of the recitation rooms.

Each room is furnished with Wales' American School Chair, and Ross's Desk, and both desk and chair are in material, form and style, as described on page 202 and 205.

This is a school for girls only, and consists of two departments, one of which is called the Grammar department, and the other the Writing department; the master of each department being independent of the other.

The number of assistant female teachers in each department of this school, when full, will be four, the teachers in each department being independent of the master and teacher in the other.

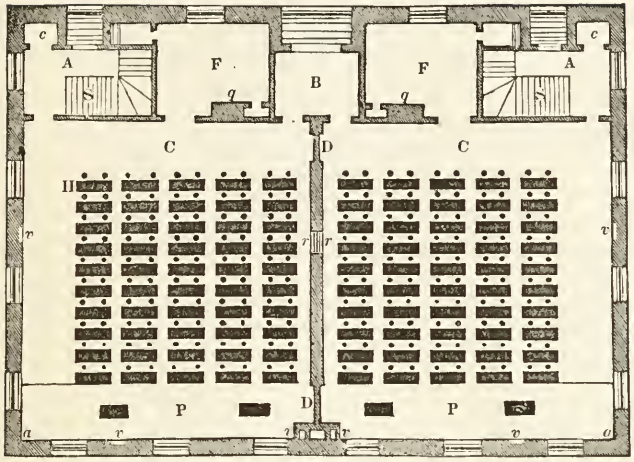
The master of the Grammar department and two of his assistants will occupy the large hall in the third story, and his other two assistants will occupy one of the rooms in the first story.

The master of the writing department and two of his assistants will occupy the rooms in the second story, and his other two assistants will occupy the other room in the first story, each master being the superintendence of his own department.

The school, when full, will be divided into five classes, and each class into two divisions, nearly equal in numbers. The first week after the vacation in August, the first division of each class will attend in the grammar department in the morning, and the second division of each class will attend in the writing department; and in the afternoon, the second division of each class will attend in the grammar department, and the first, in the writing department. The next week, this order of attendance is to be reversed, and this alteration is to continue through the year, the weeks of vacation not being counted.

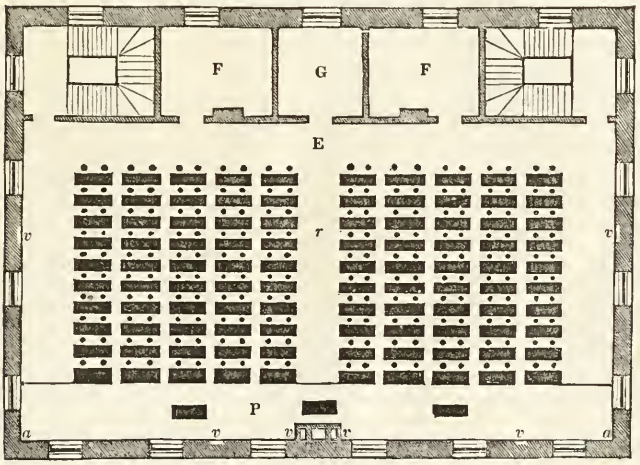
This house and the Quincy Grammar School-house are built after designs by Mr. Bryant.

PLAN OF FIRST AND SECOND FLOOR.



A, A, Entrance for Pupils.
B, Ditto for Teacher.
C, C, Study halls, each 35 by 38 feet; with seats and desks for 100 pupils.
D, Sliding door, by which the two rooms on the second floor are thrown into one.
E, Study hall, 72 feet by 38.
F, F, Two recitation rooms on each floor, 16 feet by 12.
G, Room 10 feet by 12, for library, apparatus, &c.
H, Ross' desk, and Wales' chair.
P, Teacher's platform with desk for teacher and assistants.
S, S, Staircase leading to second and third floors.
a, Case with glass doors for apparatus.
c, Closet for Teacher.
q, Grate.
r, Hot air register.
v, Flues for ventilation.

PLAN OF THIRD FLOOR.



Plan and Description of Quincy Grammar School-House, Boston.

This building, which was commenced in 1847, and dedicated on the 26th of June, 1848, is situated on a lot 90 feet by 130 feet, extending from Tyler street to Hudson street.

The ground plan is in the form of a cross, the exterior dimensions of the body being 80 feet by 58 feet, the end fronting on Tyler street. The wings are 12 feet in front by 36 feet deep. It is four stories high, with a basement 8 feet in the clear, for the furnaces and fuel, and an attic for gymnastic exercises.

Each wing contains a front and back entrance, a flight of stairs from the basement to the attic, and a room on each floor 10 feet by 11 feet, connected with a school-room.

The fourth story of the body is finished in one spacious hall, 16 feet high in the clear, with centre-pieces and a cornice, and a platform at each end 22 feet by 11 feet, and 22 inches high. It is furnished with settees arranged in 4 rows, sufficient to accommodate 700 children.

The third floor is divided by a corridor 8 feet wide, extending across the main body from one wing to the other, having 2 school-rooms on each side.

These four school-rooms are of nearly the same size, averaging about 31½ feet by 26½ feet, and 13 feet high. Each room is lighted by 2 windows at the side, and 2 at the end, and has a platform for the teacher 24 feet by about 5½, with one end towards the entrance from the corridor, and on the other end is placed a book-case of cherry, 3½ feet by 8 feet, with glazed doors, facing the entrance.

The scholars' desks front the platform and the windows on the side of the building, and are separated by aisles 1 foot and 4 inches wide. They are 2 feet in length, made of cherry-wood, and varnished and supported by cast iron stands. J. L. Ross, maker. Each scholar has a desk by himself.

The chair is made by Mr. Wales, of Boston. It has a scroll back and cast iron support.

Each room accommodates 56 pupils, one desk and chair being placed on a small movable platform for a monitor.

The rooms are lined with composition blackboards 3½ feet wide, 2 feet from the floor.

The school-rooms which have not small rooms attached, are provided with closets for the children's clothes. There are 2 sinks in the corridor, with conveniences for introducing Cochituate water. The description of this story will answer for the two below it, as the first three are essentially the same.

The windows are furnished with inside blinds, having revolving slats, so that the light may be regulated with great ease.

The building is warmed by 4 furnaces placed in the basement, 2 being placed at the middle of each end, each being intended to warm the three rooms immediately over it, the cast iron chimnies being relied upon for heating the hall.

Emerson's system of ventilation has been introduced since the building was finished, each room having a separate air-duct to the roof, 14 inches by 14 inches.

The apparatus consists of the Boston Philosophical set, by J. M. Wightman, Eayrs and Fairbanks' globe, 2 sets of Pelton's Outline Maps, and one of Mitchell's.

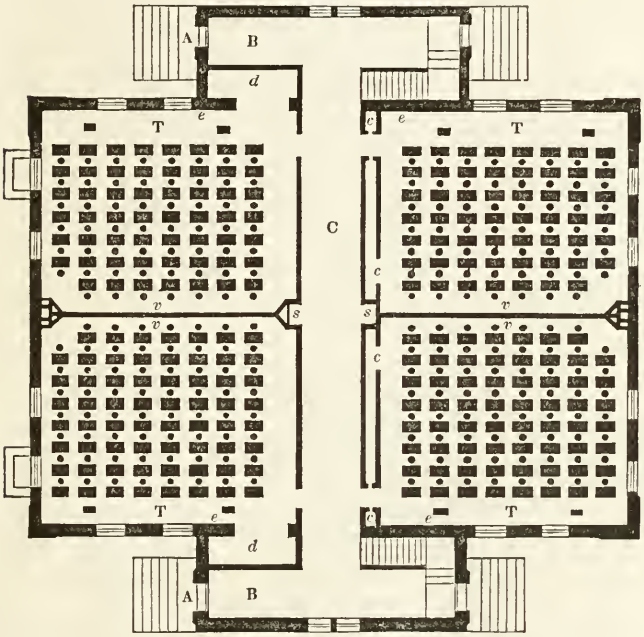
A library costing $200 has been furnished by the donation of Mayor Quincy.

To protect the desks from injury, the slate-frames are all required to be covered with cloth, and each scholar is to provide himself with a convenient box to contain his pen, pen-wiper, pencils, rubber, &c. Each desk has an inkstand sunk into the right-hand corner, with a revolving metalic cover.

The building is calculated for but one school, and is at present occupied by but one, the organization of which is adapted to the arrangement and construction of the house. When the organization is complete, the school will be divided into 4 classes, each class containing 168 scholars, and each class into 3 divisions. At present the 3 lower classes contain two divisions each, and the first class 3.

On the 3rd floor are the first division of the first class under the instruction of

the Principal, and the several divisions of the 2d class instructed by assistants; On the 2d floor is the 2d division of the 1st class instructed by the sub-master, with the several divisions of the 3d class under assistants; and the usher takes the 3rd division of the 1st class, with the several divisions of the 4th class on the 1st floor. By this arrangement the government is rendered comparatively easy. The whole school is brought together in the hall for devotional services, and other general exercises.



Plan of First Floor.

A, A, Front Door.
B, B, Entries.
C, Corridor or Hall.
T, T, T, T, Teachers' Platform 24 feet by 5½.
r, *r*, *r*, *r*, Hot-air flues.
v, *v*, *v*, *v*, Preston's Ventilators for controlling the flues in the partition wall, which communicate with the iron smoke pipes near the top of the building. This plan is adopted in the first story only.
e, *e*, *e*, *e*, Indicates the location of the flues of Emerson's Ventilators in the second, third and fourth stories.
s, Sink.
c, *c*. *c*, *c*, Closets.
d, *d*, Closets 10 feet by 11 feet

LINCOLN GRAMMAR SCHOOL, BOSTON.

Plans of Lincoln Grammar School-House, Boston.

The following description of the Lincoln Grammar School-House is taken from the annual report of the school committee for 1859 :—

"In the design of the Lincoln School-House, which is located on Broadway, near K st., South Boston, it was the intention of the accomplished architect, J. F. G. Bryant, Esq., to combine all the advantages of the interior plan of the best buildings, with an effective and tasteful exterior, without any material *increase of expense.*

"There seems to be no good reason for perpetuating that baldness and almost primitive simplicity of style which have characterized most of the school edifices of the city. It can scarcely be deemed too much to demand, that the building which is the daily resort of our children and youth, and in which their mental and moral faculties are to be trained and unfolded, should be designed with careful reference to the rules of proportion, and even, in no small degree, of beauty. Certainly it would be well to keep this object in view, so far as it is consistent with a wise and proper economy. Harmony of style, and propriety and elegance of detail, will never be without their refining influences upon the mind of the pupil.

"The following mechanical description, extracted from the 'specifications' of the architect, will illustrate the interior conveniences of the building and its adjunets, as well as the manner of construction and the formation of the exterior."

The building is a "parallelogram" in outline of ground plan, measuring ninety-three and four-twelfths feet in length, and sixty-one and two-twelfths feet in width, outside of its base or underpinning course, at the ground or sidewalk level in front of the building. It is four finished stories in hight, with an "unfinished" cellar story over the whole area, which is partially above and partially beneath ground. The cellar is nine feet high. The first, second, and third stories, respectively, twelve and one-half feet high, and the fourth story fifteen feet high. The top of the gutter of the outside walls is located four and two-twelfths feet above the ceiling of the fourth story, which ceiling is formed immediately upon the undersides of the tie-beams of the roof framing, or attic flooring. The roof is "hipped" from each of the four corners of the building, and is made a "Mansard," with curved sides and a "flat" top; the hight above the top of cornice to the top of the curve of the roof is fourteen feet; its "flat" is located in the center of the length and width thereof, and it measures eighty-six and one-half feet in length, and fifty-one and one-half feet in width, and has a pitch over its surface of one and one-half inches to a foot. The four corners of the roof are formed as projections; the spaces between the projections over all four sides of the building are recessed to intersect with recesses in the faces of the four exterior walls; said projections are hipped over the inner corner of each, in imitation of the hip over the outer corner thereof—being the corner hips of the building. The recesses in the faces of the four exterior walls aforesaid are located in the center of the length of each wall, and reach the whole hight of said walls, to meet the roof recesses abovenamed. The recesses in the front and rear end walls each measure twenty-one and five-twelfths feet in width, and those in the two side walls twenty-three feet in width. Besides the four recesses aforesaid, there are recesses in the faces of the projections, or corners, which are formed to each exterior wall, beneath the roof projections; these recesses reach from the ground level up to the top of the third story, where they are formed with semicircular heads. The recesses in the corner projections of the front and rear ends of the house measure eleven feet and three and one-half inches wide, and four inches deep, and are single recesses; and the recesses in the corner projections of the two side walls of the house are eleven feet and three and one-half inches wide, and four inches deep, and are double recesses, with a dividing pilaster located in the center of the width of each of the same, and double semicircular heads to each recess,

springing from said pilasters. The four exterior walls are crowned with a cornice, the upper portion of which is formed as a gutter.

The interior arrangement of the first, second, and third stories is similar: each containing four apartments, located in the four corners of the house, measuring thirty-two and three-twelfths feet by twenty-seven and ten-twelfths feet each; a clothes closet to each room, measuring fifteen feet by five and ten-twelfths feet each; two staircases, measuring fifteen and eight-twelfths feet by ten feet each; and a hall, measuring twenty-four and eight-twelfths feet by twenty-two and four-twelfths feet. Said rooms, closets, staircases, and halls are twelve and one-half feet high, in the clear, in each story. The interior of the fourth or upper story is arranged with two rooms in the two front end corners of the house, each measuring thirty-two and three-twelfths feet by twenty-seven and ten-twelfths feet; an exhibition hall, measuring thirty-eight and nine-twelfths feet by fifty-six and eight-twelfths feet, across the rear end of the house. There are two stairways, measuring five feet by ten feet; a clothes closet for each of the two rooms aforesaid, measuring five and ten-twelfths feet by fifteen feet each; two teachers' rooms (of L form,) measuring five feet by twenty-five feet each; and a hall, connecting with the exhibition hall, measuring twenty-two and four-twelfths feet by twenty-four and eight-twelfths feet. All the apartments, halls, closets, and staircases aforesaid in the four stories are "finished." The cellar story is subdivided into four apartments, in the four corners of the house, two staircases, and six closets. The apartments in the cellar are each to contain a furnace, and the closets are used for fuel. None of the cellar apartments or closets are "finished." There is also a hall in the center, of the length and width of the cellar story, into which the mouths of the four furnaces, the landing of the staircases, and the doors of the six fuel-closets all open.

All the apartments, halls, and closets in the fouth story are fifteen feet high. The teachers' rooms in this story have their floors located two feet above the floors of the other apartments. Each story is lighted by windows in the exterior walls. There are floor-lights in the hall of each story, immediately beneath the cupola or bell-tower, which crowns the roof of the house, in the center of its length and width. The four sides of the base or plinth of this cupola (above the roof level,) contain each an upright skylight. The attic or area beneath the roof is lighted by light stationary circular or "bull's-eye" windows, inserted in the upright circular sides of the "Mansard" roof. There are no chimneys, other than metal pipes, in any part of the building, excepting one brick chimney located over the wall which forms the inside end of the exhibition hall. There are two entrances to the building in the first story, in the two sides of the same.

The lot measures one hundred feet in front by one hundred and seventy-five in depth, and contains seventeen thousand five hundred square feet. It is inclosed on the sides and rear end by a substantial brick wall, and in front by a granite foundation, surmounted by an ornamental iron fence. The rear portion of the yard is divided into two equal parts, by a brick wall running from the center of the building to the rear boundary.

The building is warmed by Chilson's cone furnaces, four in number, located in the center apartment of the basement. The cast-iron smoke pipes pass up through and warm the corridors.

The ventilating apparatus consists of a separate ventiduct of wood, leading from each school room to the roof. Here they are brought into two groups, at the opposite ends of the building, each of which is surmounted with one of Emerson's ejectors, of a large size. The transverse section of each ventiduct is about fourteen inches square. In each room there is a sliding register near the ceiling, and another near the floor, opening into its ventiduct.

A. A., &c., School rooms, twenty-three by twenty-seven feet.

C. C., Closets for clothes.

B., Exhibition hall, two-hundred and thirty-eight by fifty-six feet.

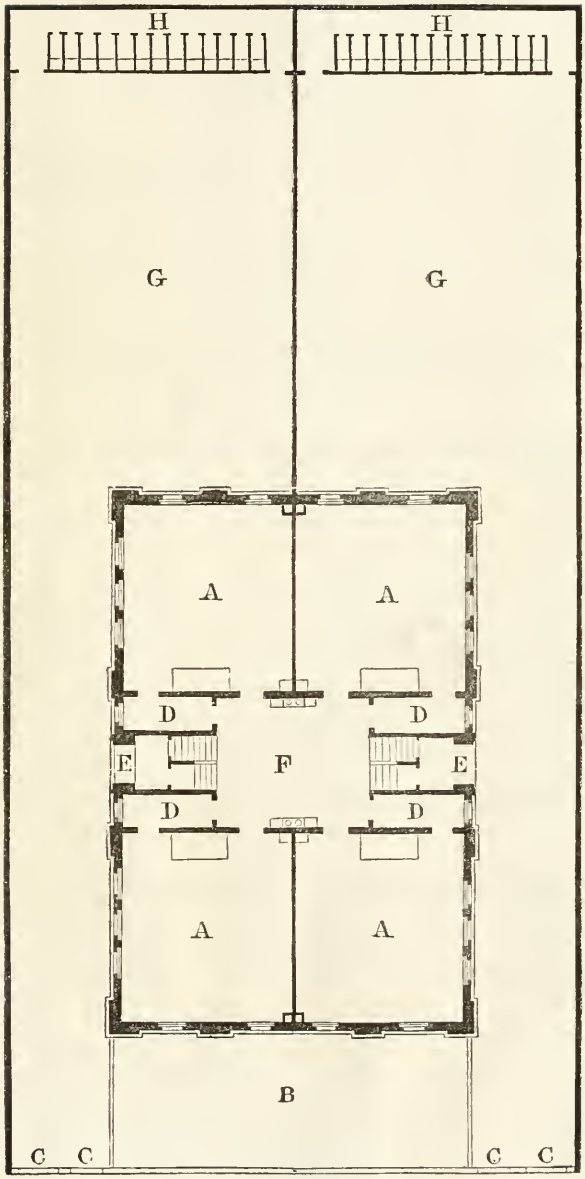


Fig. 2. Ground Plan.

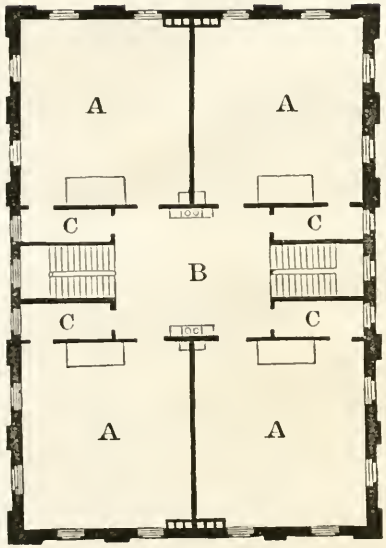


Fig. 3. Second Story.

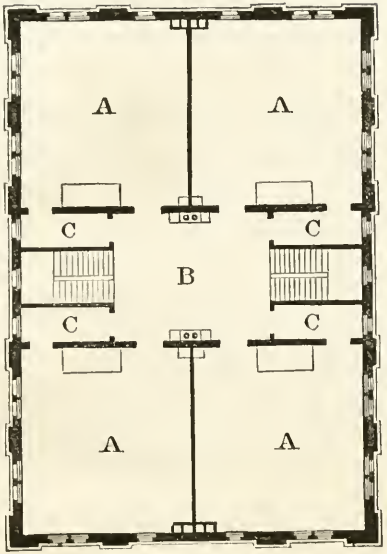


Fig. 4. Third Story.

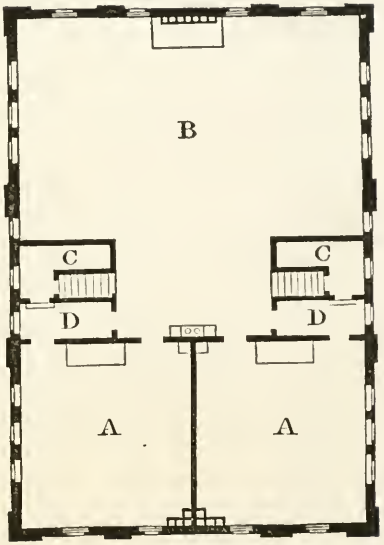


Fig. 5. Fourth Story.

THE LINCOLN GRAMMAR SCHOOL-HOUSE was dedicated on the 17th of September, 1859,—the day on which the Statue of Daniel Webster, in the State-House Grounds, was inaugurated by appropriate exercises. From the address of the Mayor, Mr. Lincoln, (after whom this spacious and commodious structure was named,) we give the following extracts:—

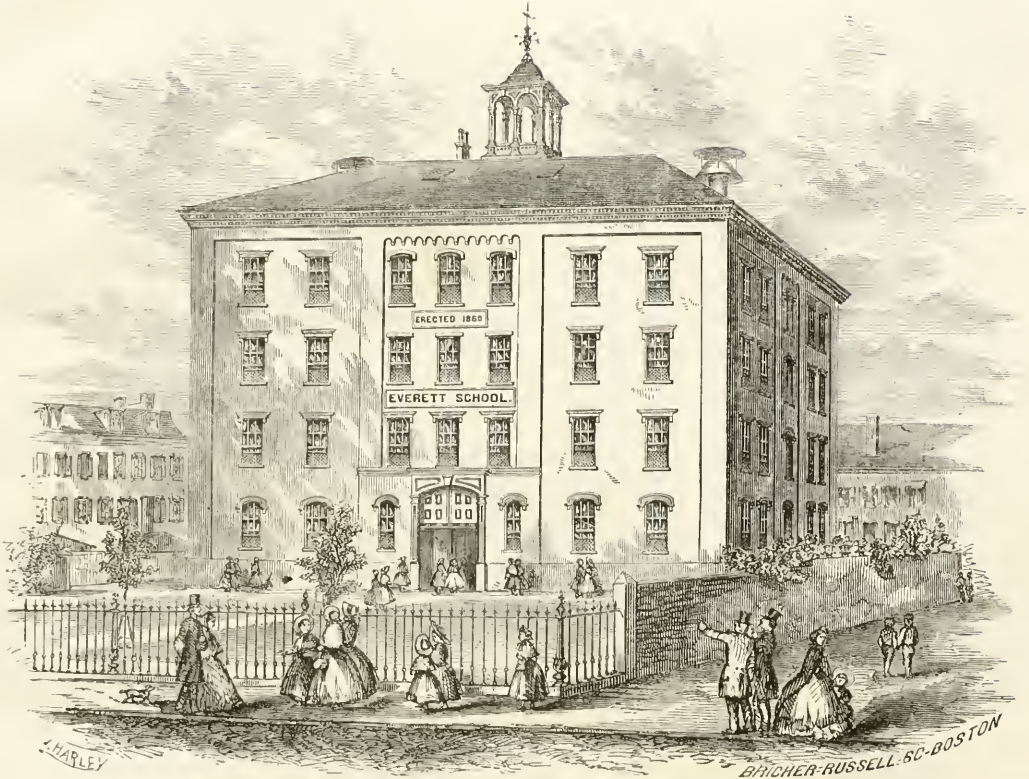
Boston, through its whole history, has regarded this as one of its dearest interests, from that April 13th, 1635, when "it was agreed upon that our Brother Philemon Purmont, shall be intreated to become a schoolmaster for teaching and nurturing of children with us," to this day, the two hundred and twenty-ninth anniversary of its settlement, when we are assembled to dedicate the most elegant edifice yet erected within our limits to be devoted to this great cause.

The School-house and the Church have stood by the side of each other as the two main pillars which support our social fabric, and when either of them goes to decay, fallen will be our fortunes, and the days of our prosperity will be numbered and gone.

A few years since an intelligent foreigner visited all parts of the Union, and without prejudice or favor examined the condition of every community. He was struck with the industry, thrift, and general culture of the people of New England. He went into a thorough examination of the primary cause of this state of things. It could not be, he thought, our climate or the nature of our soil, for Providence had more richly endowed other portions of the land; it could not be our ancestors, for they were from the same stock as some other portions of the Union, coming from every county of old England, with representatives also from every nation of the European world; it could not be a special form or system of religious faith, for all sects had their disciples, and universal toleration gave no one a supremacy over the others; it could not be political institutions, for we were all alike under the Republic; and he finally came to the conclusion that the problem could only be solved by the fact that we had enjoyed for upwards of two centuries the benefits of free public schools.

In this connection, associated as this very day will be in our memories by the erection of a statue in our city, of the great statesman, Daniel Webster, I can not forbear to quote some of his own language in regard to this subject. He said, in a communication addressed to the Hon. Mr. Twistleton, of England, which was afterwards laid before a committee of the House of Commons: "I have been familiar with the New England system of free schools for above fifty years, and I heartily approve of it. I owe to it my early training. In my own recollection of these schools, there exists to this moment a fresh feeling of the sobriety of the teachers, the good order of the school, the reverence with which the Scriptures were read, and the strictness with which all moral duties were enjoyed and enforced. In these schools, or it may be partly by my mother's care, I was taught the elements of letters so early that I never have been able to remember a time when I could not read the New Testament, and did not read it. Many moral tales and instructive and well-contrived fables, always so alluring to childhood, learned by heart in these schools, are still perfectly preserved in my memory. And, in my own case, I can say that without these early means of instruction ordained by law, and brought home to the small villages and hamlets for the use of all their children equally, I do not see how I should have been able to become so far instructed in the elements of knowledge as to be fit for higher schools.

"In my opinion, the instruction communicated in the free schools of New England has a direct effect for good on the morals of youth. It represses vicious inclinations, it inspires love of character, and it awakens honorable aspirations. In short, I have no conception of any manner in which the popular republican institutions under which we live could possibly be preserved if early education were not freely furnished to all, by public law, in such forms that all shall gladly avail themselves of it. As the present tendency of things is to extend popular power, the peace and well-being of society required at the same time a corresponding extension of popular knowledge."



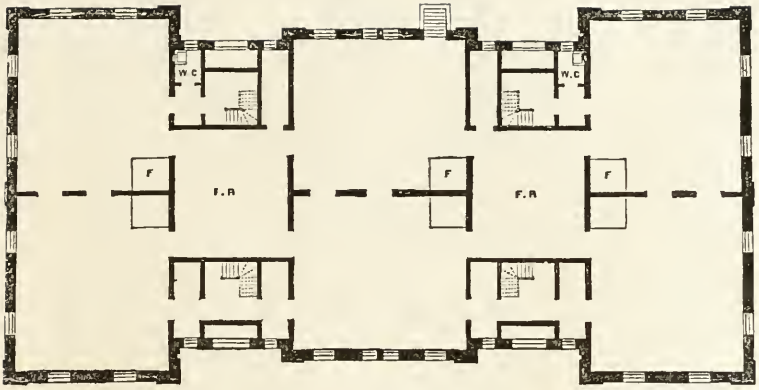
EVERETT GRAMMAR SCHOOL, BOSTON. ERECTED, 1860.

Plans of Prescott Grammar School-house, Boston.

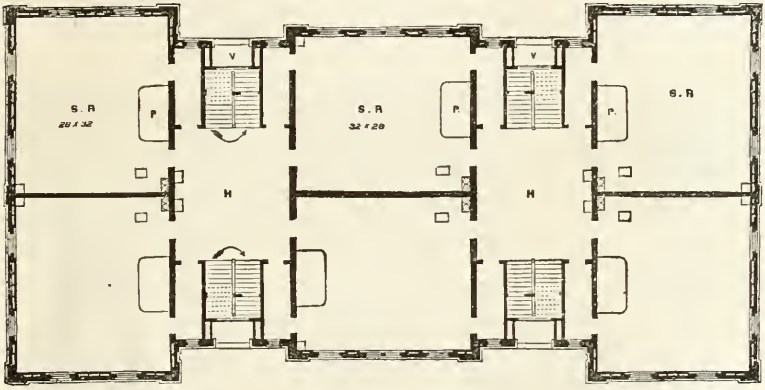
The following description of the Prescott Grammar School-house, prepared by Hon. John D. Philbrick, Superintendent of Public Schools, is taken from the Annual Report of the School Committee for 1865: —

This noble edifice, which is well represented in the accompanying perspective view, is located in the easterly part of East Boston, about two miles from the City Hall. It stands near the centre of a lot which is just two hundred feet square, and is bounded on three sides by wide streets. It has a frontage of one hundred and thirty-eight feet on Prescott Street, and sixty-eight feet on Bennington and Saratoga Streets, respectively. It is three stories high, exclusive of the basement and attic. From an inspection of the accompanying cuts it will be seen that the ground plan of the building consists of five parts, namely, a central portion thirty-five feet by sixty, two wings, each thirty-one feet by sixty-eight; and two entrance halls, connecting the wings with the central portion, each twenty-one feet by fifty-six. There are four entrances, one in the front and one in the rear of each entrance hall, the two principal or front entrances being on Prescott Street. In each of the entrance halls there are two well-lighted staircases, leading from the first to the second story, and one leading from the second to the third story. The building contains *sixteen* school-rooms, of the same size, namely, twenty-eight feet by thirty-two. Six of these rooms are on the first floor, six on the second, and four on the third. It will be seen, on examining the plans, that each of the twelve rooms which are in the wings has a spacious and well-lighted clothes-closet attached, and that each of the four rooms in the central portion has two such closets. Each of these closets communicates both with its adjacent school-room and entrance hall, and serves as a passage-way for the pupils in going in and out of their rooms These closets are only half a story in height, there being above each an apartment of the same size and height, which is entered from a middle landing of a staircase. The latter are designed for dressing-rooms and water-closets for teachers, receptacles for books, school apparatus, etc. The school-rooms of the first and second stories are twelve and a half feet high in the clear; and those of the third story fourteen feet. The whole of the third story of the central portion, with a part of the space over each entrance hall, is devoted to an assembly and exhibition hall, which is sixty-five feet long, fifty-seven feet wide, and eighteen feet high. This is the largest and best hall for school purposes in the city. Its symmetrical and convenient arrangement is shown in plan No. 3. The basement, which is well paved with bricks, is ten feet high, and its extensive area, with the exception of the space occupied by the heating apparatus, is available as play-rooms for the pupils in stormy weather. The floors of the entrance halls are rendered fire-proof by means of iron beams supporting brick arches, on which are laid North River flagging stones. The other floors are laid with scantlings 1¾ by 1¾ inches, blind-nailed, forming a solid and smooth surface, — such as is needed for receiving the screws which secure the seats and desks, — without any wide cracks at the joints. All the windows are fitted with inside folding blinds, and those on the northerly and westeriy sides have double sashes. The halls in each story are furnished with sinks, which are supplied with water from the Cochituate pipes. All the rooms are brought into communication with the master's room by means of speaking tubes and bells. Each of the school-rooms is furnished with fifty-six single desks and chairs of the most approved

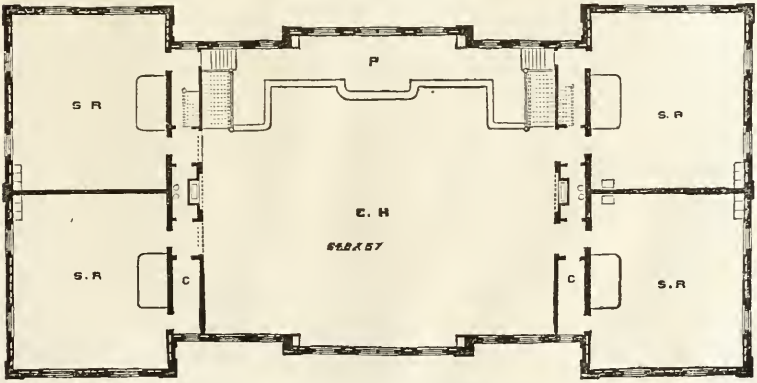
PERSPECTIVE OF PRESCOTT GRAMMAR SCHOOL-HOUSE, BOSTON.



Plan No. 1. Basement.



Plan No. 2. First and Second Floors.



Plan No. 3. Third Floor.

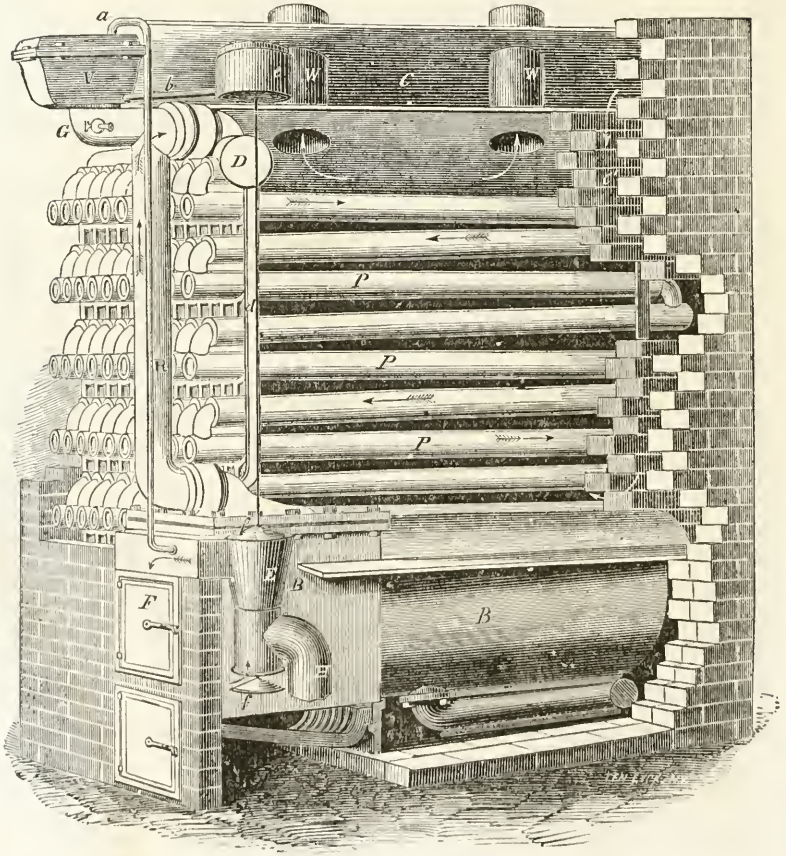
PLAN No. 2.—S. R. School-room.
P. Teacher's Platform.
H. Corridor.
V. Vestibule.

PLAN No. 3.—S. R. School-room.
E. H. Assembly Hall.
P. Platform.
C. Clothes Closet.

patterns. All the school furniture proper for teachers and pupils was manufactured at the establishment of J. L. Ross, of the best materials, and in the most workmanlike manner. The teachers' chairs and the settees for the large hall were furnished by John C. Hubbard, whose work in this line is always of the very first quality.

The method of ventilation does not differ essentially from that which has been applied to the other Grammar School-houses, excepting the Bowditch School-house. A ventiduct 16 × 16 inches in the clear, constructed of smoothly planed matched boards, is carried up from the floor of each room to the attic. Here these ventiducts are united in three groups, each group being carried up through the roof in a single shaft, which is surmounted by a 42-inch Leed's cap. Each ventiduct has two openings, which are fitted with valves, one being near the ceiling of the room from which it leads, and the other near the floor.

The building is heated by Brown's self-regulating, hot-water furnaces, which were furnished and set up by Geo. W. Walker & Co. The following description and cut, taken from the manufacturer's circular, present the essential features of this apparatus for heating. In this building there are three boilers, and to secure an equal distribution of the heating power, there is an independent stack of hot-water pipes in a separate air-chamber for each school-room.



"This hot-water apparatus consists of a horizontal boiler (*B*) which encloses the fire, insuring perfect safety, and precluding all possibility of any portion of the fire surface being heated above the boiling point. Over the boiler, and forming a continuation of it, is a stack of cast-iron pipes (*P*), arranged in horizontal convolutions, and filled, like the boiler, with water. A constant circulation of hot water is kept up through every portion of the radiating pipe, so long as the fire in the boiler is maintained.

A solid foundation of brickwork being prepared, the boiler (*B*) is set therein, the fire (*F*) being lit in the front of it, and the fire-box is made of the boiler itself, so that all the available heat produced by the combustion of the fuel is absorbed by the water. The entire apparatus being filled and the fire made, the water gradually ascends through the rising pipe (*R*) to the distributing pipe (*D*), and displaces the water in the pipes, causing it to pass into the boiler through the return pipe, (seen at bottom of boiler,) thus a continuous circulation of hot water is secured. The arrows in the cut indicate the direction of the currents.

The boiling of the water in the apparatus actuates the draft regulator. When the furnace is full of water, the bottom of a portion of the box (*V*) is covered with water to the depth of an inch, the box (*V*) is divided up to about four-fifths of its height, and a siphon connects the two compartments.

When ebullition commences, the water is thrown over the top of the partition and passes through the pipe (*b*) into the box (*e*), that contains a float which, as it rises, closes the lower valve (*f*), (which through pipe *H*, supplies the draft to the fire,) and elevates the upper valve (*f*), in order to admit the cold air on the top of the fire and thus check the boiling. The water having ceased to boil, returns from box (*e*) to box (*V*) through the siphon. The consequent descent of the float and valves allows the draft to pass under the fire until ebullition again takes place.

Danger from fire is entirely out of the question, and as the fire is surrounded by cast iron, lined (so to speak) with water, and as the tendency of fluids, when heated, is upward, and to descend when cooled, that portion of the boiler exposed to the fire is always the coolest part of the apparatus. The stack of pipe is enclosed on either side by two walls; and the exterior air, after passing by a conduit (*C*) constructed for the purpose, into the space between them, and being warmed by contact with the pipes, rises through the conductors (*W*) and the registers into the rooms it is designed to warm. Nothing can be more wholesome, pure and refreshing than the atmosphere thus evolved. No pernicious gases are present. No offensive odor is perceptible in the air warmed in this manner."

As an aid to proper ventilation (a subject of vital importance), this invention seems to have some important advantages. The fact that the radiating surface is at so low a temperature (below 212°), shows that a very great volume of air is required to warm an apartment sufficiently, which, when provided with means of egress, will most thoroughly ventilate by forcing out the impure atmosphere through the flues provided for the purpose.

The style of architecture resembles the Italian, with bracketed cornice, and pilasters at the intersections of the exterior and partition walls. All the walls, including the partitions, are constructed of bricks. The exterior walls are faced with pressed bricks, and buil. with a four-inch air space between the outer and inner surfaces The basement, string course, and door and window dressing are to fine hammered Rockport granite. The cornice is of wood. The roof is covered with Welsh slate, and fitted with copper gutters. The interior standing wood-work is grained in a very tasteful style.

The yard is enclosed on the three sides which are bounded by streets, by a substantial and handsome iron fence, and on the back

side by the water-closets and a brick wall. The rear portion of the yard, which is used as a play-ground, is paved with bricks; the front part is to be ornamented with trees, shrubs and flowers.

The contractors who furnished the heating apparatus and the furniture have already been named, and it is but just to record here the names of other parties who have, in various ways, contributed by their skill and taste to the construction of this great and well-built school-house. The excellence of the painting and graining is due to James Ransom; of the mason work, to Sayward and Lothrop; of the carpenter work, to Isaac C. Trowbridge; and of the slating, to C. S. Parker and Sons. Its architectural merit is due to George S. Ropes, Jr., the able architect. The adoption of the design was secured mainly through the influence of Judge Wright, of the Committee. Mr. James C. Tucker, Superintendent of Public Buildings, had the immediate supervision of its erection, — a duty which he performed with great fidelity and good judgment. Special credit belongs to the Sub-Committee of the City Council, consisting of Alderman Davies and Councilmen C. R. McLean and N. M. Morrison, who had the entire responsibility of the execution of the work in their hands, and who spared no pains to render it satisfactory and complete in all its parts, "from turret to foundation stone."

The cost of the lot was about $8,000, and the whole cost of the building and lot, including the iron fence, the furniture and heating apparatus, was $109,585.76.

Thus has been designed and erected the largest and most costly school edifice in Boston, and perhaps in the whole country. Two of the objections to the plan of the Grammar School-houses which we have built in the course of the last year, namely, the too great height of four stories, and the imperfections of the exhibition halls, have been obviated in the plan of the Prescott School-house. To accomplish this, a larger size was adopted. Whether the future Grammar School buildings shall be constructed on this model, in respect to size, is a question for the School Board to decide.

We subjoin from Mr. Philbrick's Twelfth Semi-Annual Report as Superintendent of Public Schools, for March 1866, the following remarks on the *proper size* of Grammar Schools in Boston. —

After much study and many efforts, we seem to have settled some important points in building school-houses, such as the mode of seating, the providing of a separate school-room for each teacher, and the proper model of such rooms as to size, arrangements, and the essentials of the clothes-rooms connected with the school-rooms. In these particulars our more recent school-houses are as good as could be desired. In a pamphlet by G. P. Randall, an accomplished architect in Chicago, containing plans in perspective of several noble school-houses which have recently been erected in the Northwestern States, — a document well calculated to open our eyes to the extraordinary educational enterprise of that section of the country, — I find the following statement respecting the arrangements of school-rooms.

"It is now pretty generally admitted by practical educators that a single room, large enough to seat from fifty to sixty-five scholars, and exclusively under the supervision and instruction of a single teacher, is better than a larger room, with recitation rooms and assistant teachers. I make designs for them both ways, but probably not more than one in fifteen with the large room and recitation rooms attached. As I am generally *instructed* in this matter, it follows that teachers are almost unanimous in the opinion that the single room system is the best; and it is the system adopted by the School Board of Chicago in the public schools of this city."

The origin of this system may be easily traced to the Quincy Grammar school-house, in this city, erected in 1847–48, the plans and description of which were published in Barnard's School Architecture. Another feature of this edifice as it then was, has not been so generally imitated, but which, I trust, will ultimately come to be considered an indispensable element in every Grammar School-house, namely, — *a hall large enough to seat comfortably all the pupils accommodated in the several school-rooms.* This is the case already in the city of New York.

But in respect to the important elements of heating and warming, we are still unsettled. Within the past twenty years there have been three radical changes made in the mode of heating our Primary school-houses. First, the old-fashioned coal stove gave place to Clark's ventilating stove. Subsequently this stove gradually went out of use, and in its place the ordinary cylinder coal stove was substituted. Lastly, this stove has been removed and hot-air furnaces introduced The High School buildings are heated with hot-air furnaces; and nineteen of the Grammar School buildings are heated in the same way, while two are furnished with different systems of steam-heating apparatus. For ventilation, most of the buildings have Emerson's caps, with a separate ventiduct for each room, furnished with two registers, one near the ceiling and one near the floor. Robinson's system has been applied to one Grammar and one Primary building, the Normal Hall is furnished with the Archimedean system, and the Prescott School with Leed's caps. To furnish school-rooms in large and high buildings with an abundant supply of pure air of the requisite temperature and humidity, for health and comfort, is a difficult problem. Considerable progress has been made, no doubt, towards its solution, and it is hoped that the Committee on Public Buildings will continue to experiment upon it, guided by the principles of science and the light of experience, until satisfactory results are reached.

The question as to the maximum number of stories in height to which a school-house should be carried has caused some discussion amongst us. Nearly all the Grammar school-houses are at least four stories high. Several are practically five stories in height, as they have their play-ground on a level with the basement. There can be but one argument thought of in favor of carrying school-buildings up to this great height, and that is the argument of economy. As sky costs nothing, the expense of a building four stories high is less than one of the same capacity which is two or three stories high. But a school-house is never truly economical unless *it meets the requirements of health, convenience and safety.* In all these respects the four-story plan is decidedly objectionable, and I earnestly hope that it will be wholly and forever repudiated. In Baltimore a large and fine building has been erected for a Girls' High School. This edifice is only *two stories* high. There is in the same city another building three stories high occupied by a school of the same description. This school-house is considered too high, and it is proposed to build one to take its place which shall be only two stories high. In this particular the educational policy of Baltimore is certainly wiser than that of our own city, and more truly economical. Our new Primary school-houses are, with a single exception, three stories high, and it is to be hoped that no one will ever seriously think of carrying one to a greater height.

I have said that we seem to have arrived at a definite idea of what a school-room should be in respect to size, arrangements, proportion and seating. This is an important step gained. *But what should be the standard number of rooms for a building?* This is a question which has very important bearings on the interests of our schools, and it deserves the most serious consideration of the Board. In what I have to say on this topic, I do not propose to refer to High School

buildings, which constitute a class by themselves. By referring to the list of our school-houses, it will be seen that fourteen school-rooms is the number contained in each of the more recent buildings, excepting that of the Prescott School, which has sixteen. The former number of rooms will accommodate about 800 pupils and the latter 900. It thus appears that the Prescott school-house, the latest on the list, is designed to accommodate a hundred more pupils than could be seated in any one of the very large buildings which had been previously erected. Now, in view of our system of classification, the course of study required, the way in which pupils are promoted, the management in respect to graduation, and the distribution of the work of instruction to teachers of different sexes and grades, — considering these circumstances, and looking back upon the operation of the schools twenty years ago, when the number of pupils to a master averaged about one-third as high as it now does, to my mind it is clear that *the tendency to increase the size of our schools is a bad tendency.* Other things being equal, I should much prefer to send a child to one of our schools of the smallest size rather than to one of the largest. It is true, in general, that a large school may be more efficient and economical than a small one. But there must be a limit somewhere. It is certain that a school may be too large as well as too small. In some cities the schools are too small, in others they are too large. There are two objections to small schools; first, the expense of salaries sufficient to secure first-rate principals, — and without such principals you can never have superior schools; and, second, they cannot be perfectly classified, and so the teaching power cannot be applied to the best advantage. On the other hand, as you increase the size of a school, *conducted on our present plan*, you diminish the chances which a pupil has to get through the school and graduate at a suitable age. I do not say that our schools *might not be organized and conducted* in such a manner as to obviate this objection, but the accomplishment of this object in the face of the opposition which it would inevitably encounter, is a consummation rather to be desired than expected. Instead, therefore, of attempting to change the organization so as to adapt it to the largest sized building, it seems to me wiser and more practicable to adapt the size of the buildings hereafter erected to the organization as it now exists.

But besides the radical objections to the size of the largest buildings already stated, there are others of grave importance. One of these is its tendency to keep large and numerous "school colonies," so called, in poor and unfit accommodations. Ever since the large schools have been in fashion, we have had almost continually large colonies, or branches of one or more Grammar Schools, stowed away in rented rooms, where the pupils suffer many inconveniences and disadvantages. The Chapman School had colonies scattered about in different buildings for eight or ten years, before it was relieved by the erection of the Prescott house. There are still at this very time eight of our Grammar Schools with colonies of this description attached, comprising twenty-five divisions, with pupils enough to make three good-sized Grammar Schools. The cause of this state of things is plain enough. It is found in the policy of building very large school-houses. For it is obvious, that in order to justify the great expense of erecting one of these colossal edifices, there must be a large surplus of pupils in a given locality. To furnish these colonies with better accommodations, it has been proposed, in two or three cases, to erect buildings for their special use, thus making them permanent branch-schools — a remedy worse than the disease, and tending only to aggravate and perpetuate all the evils of overgrown schools. The true and effectual remedy for this great evil of keeping in operation so many colonies outside the regular school organization, is to be found in the policy of limiting the size of our buildings to reasonable dimensions.

There is another serious evil connected with this system which has been too little regarded. It is the necessity which it involves of bringing together, to make up the schools, the most diverse and heterogeneous materials. I know this is an extremely delicate subject to touch upon, but I am satisfied that it ought to be considered, and therefore I shall venture to throw out some suggestions upon it, and take the risk of having both my motives and my judgment condemned. My sympathies naturally lean very strongly to the indigent classes who are struggling to better their condition. But I remember that the image of Justice is pictured to us with bandaged eyes, to symbolize her impartiality. The just rights of all classes should be equally regarded; and while we are anxious to provide every needed facility for the education of the children of the poor, I think we ought not to ignore the educational wants of the wealthy portion of the community, who pay taxes so largely and liberally for the support of our schools. I think that Beacon Hill* should be just as well provided for as Fort Hill.† But if you build a school-house large enough to accommodate both localities, and require the parents to send their children to that one school or none, it is obvious that both sections are not equally provided for. But this supposed extreme case illustrates the kind of injustice we are doing, to a greater or less extent, all over the city, by the large-school system. I often point with satisfaction and pride, as an evidence of the success of our system of common schools, to the fact that boys from the wealthier families, and the sons of the highest officials, are found in the same schools with the child of the African race, and the poor newsboy. But I see plainly that there are necessary limitations, even in our intensely democratic community, in the practical application of this idea of bringing together the representatives of the extremes of society in the same school-rooms. The children of the poor must go to such schools as are provided for them, or not go at all: but if the schools provided do not suit the taste of the wealthy parent, he can and will withdraw his children and put them under private tuition. You may say, let him do it, then. That is not my way of disposing of the matter. I hold to the great principle that public schools should not only be free to all, but that they should be made good enough for all, so that, as far as practicable, the children of all classes may attend them. To this end the schools must be *adapted to the wants of all*. I am well aware that this cannot be done in this country by copying the British system of caste schools, which is based on the idea that the laboring classes, the middling classes and the aristocracy, must each be educated in separate and distinct classes of educational institutions. I only mean to maintain, and this I do maintain firmly, that the wealthy citizen in Boston ought not to be virtually deprived of the advantages of the Public School, which he would enjoy *incidentally*, if the school-houses were only kept within the limits as to size which a proper regard to efficiency and true economy demands.

. . . . . .

Having now presented some of the objections to the policy of building very large edifices for Grammar Schools, I am prepared to give my answer to the practical question. What should be considered the standard size for a Grammar school-house? I proceed on the assumption that there is a natural limit to the size of such a school for the purposes of economy and efficiency. And in view of the vast and varied interests involved in the management of public education, it is highly important to understand what that limit is, and to make our school architecture conform to it. This principle is aptly illustrated in navigation. The size of the vessel must be adapted to the business, or profits do not accrue. What would be thought of the business

* The residence of the wealthiest inhabitants.
† The residence of the poorest foreigners.

sagacity of the ship owner who should send his coasting schooner to India, and put his Indiaman to the coasting service? What steam is in navigation, classification or grading is in school economy. But the application of steam to navigation has its natural limitations, as the experiment of the Great Eastern has proved. And so has classification its proper limits, as has already been shown in some overgrown graded schools which seem to have been modelled on the pattern of the mammoth steamship. To determine the proper size of a Grammar School, it is only necessary to ascertain how many pupils are required to secure a good classification, and then adapt the size of the edifice to the accommodation of this number. To ascertain this number is a practical problem. It is easily solved by experience. Every intelligent educator understands it. All would not of course fix upon exactly the same number, but there would not be an essential difference of opinion among experts. The able superintendent of schools of New Haven thinks that both the Primary and Grammar grades combined in one organization in one building require only about 750 pupils for the purposes of a good classification; and he bases his recommendations respecting school architecture on this conclusion. Thus I should regard as the minimum number for the purpose, if I must take in pupils from five to sixteen years of age. But our system of Grammar Schools includes pupils from eight to sixteen years of age. Within this range, I consider 500 pupils about a fair average necessary for the purposes of a good classification, and a building large enough to accommodate this number is my standard for a Grammar School organized as ours are. I do not say that I would never build one larger or smaller; I should pay a proper regard to other considerations in every particular case to be provided for. But this would be my standard, all variations from it being considered as exceptions. Now, what sort of a building will answer this purpose? I answer, a building nearly resembling the Chapman schoolhouse in proportions and capacity, being three stories high, *and having ten school-rooms, and a hall large enough to seat all the pupils* accommodated in the school-rooms. I do not name the Chapman as a building to copy in all details, nor yet in architectural taste, for it is by no means a model in respect to beauty; but I refer to it as containing the essential accommodations for a Boston Grammar School. We may take pride in showing strangers an enormous four-story school-house, as evidence of our liberal provisions for free schools, but we cannot afford to sacrifice our substantial educational interests for the sake of any such gratification. We do not want mere show schools: we want real educating schools.

Twenty years ago I strenuously advocated the policy of large schools, according to the extent of my limited influence. But at that time the question was not between schools of five hundred pupils and schools of a thousand, under one head, but between those of two or three hundred and those of five hundred. What was then deemed a large school is now reckoned (with us) a small school. Twenty years ago I ventured to predict that the increase of the size of our schools to five hundred or six hundred pupils under one master would elevate the position of the master and secure for him a higher salary,—a very important consideration in school economy. My anticipations have been more than realized. But this is only an incidental advantage of large schools, and it will not do to increase the size of schools without limit, merely to create responsible situations for principals. Besides, a Grammar School of five hundred, with the Primary Schools grouped around which should be placed under the same head, is as large as is desirable for the proper supervision of one principal.

I have thus protracted the discussion of this topic, because it seems to me a topic of vital importance, and if what I have said shall lead to a careful consideration of it by the School Board and the City Council, my object will be accomplished.

Plan of the Norcross School-house.

The building is located on a lot of land bounded on three of its sides by D, Fifth, and Gold streets, the principal front facing on D Street. The building is three stories high exclusive of the basement and attic, the main building having a frontage on D Street of 90 ft. 4 in., and on Fifth and Gold streets 61 ft. 8 in. In the centre of the D-street and rear sides is an *avant corps*, or projection from the main building, each projecting 7 ft. 4 in. and having a width of 34 ft. The entrances to the building, of which there are two, one in front, the other in the rear, are in the projections. The entrance hall extends across the building from front to rear and is 22 ft. wide in the centre of the building, a staircase and scholars' cloak-rooms occupying a portion of the width at each end of the hall.

On each side of the entrance hall, in each of the three stories, are two school-rooms, each 29 by 32 ft. and 12 ft. 6 in. high. Each of these rooms, twelve in all, has its separate cloak-room for scholars, each about 5 by 17 ft., connecting both with hall and school-room, and a small room for the teacher, 6 by 10 ft., connecting with the school-room. The teachers' rooms are located in the angles of the projections, a broad and well lighted staircase occupying the middle portion at each end of the halls. In the attic, the whole of the main building within the high Mansard roof, is devoted to a hall about 54 by 80 ft. and 16 ft. high, for exhibitions and general exercises; in the projections are the staircases and closets for apparatus, &c. The large hall is lighted from all sides, and the whole floor space is clear of obstructions, a handsome stucco cornice finishes the angle of the walls and ceiling, and the walls, which are entirely vertical, are finished about 4 ft. high with hard wood. It is larger than any other school-house hall in the city.

The basement is 10 ft. high in the clear, 5 ft. of which is above the level of the yard paving. In this story is a Committee room about 17 by 30 ft., a janitor's room, teachers' water closets, the heating apparatus and fuel room, and two play-rooms for scholars, each 29 by 32 ft.

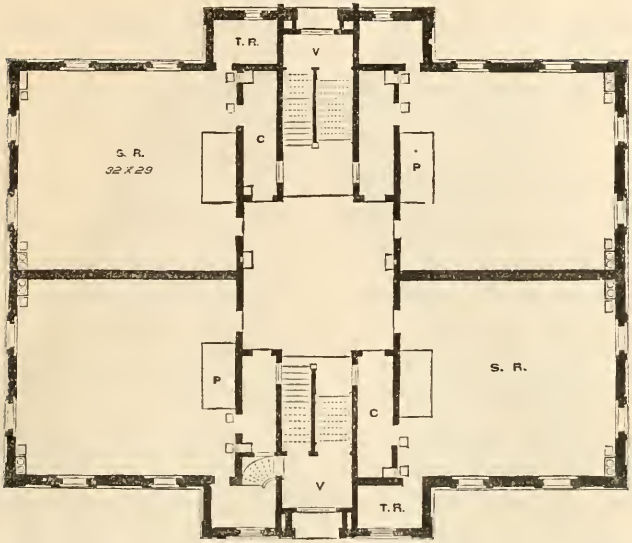
Each school-room is furnished with 56 single desks and chairs, a teacher's platform, desk, chair, and waste-basket, a clock and thermometer, blackboards on two sides of each room, with neat receptacles for chalk at the bottom, and cases within the thickness of the partition walls for containing chalk and other necessary articles.

Each school-room is lighted by four large windows, which are provided with inside blinds with rolling slats, for regulating the quantity of light. All the school-rooms and the large hall are in communication with the head master's room by means of bells and speaking tubes.

In the corridor of each story are two enamelled iron sinks supplied with Cochituate water. The teachers' closets in the basement are fitted with wash-bowls and water-closets. The school privies are

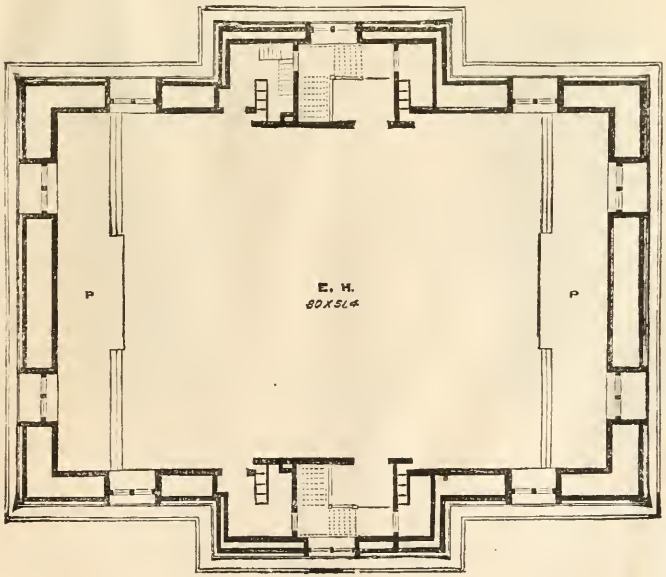
NORCROSS GRAMMAR SCHOOL-HOUSE. BOSTON.

1. First, Second, and Third Floors.



S. R. School Room. C. Clothes Room. T. R. Teacher's Room. P. Platform.

2. Hall.



located in the rear of the yard, and are approached by a covered and screened passage from the rear entrance of the building.

All the standing wood work is of a beautiful brown ash wood. The wood is gummed to fill the grain and then oiled.

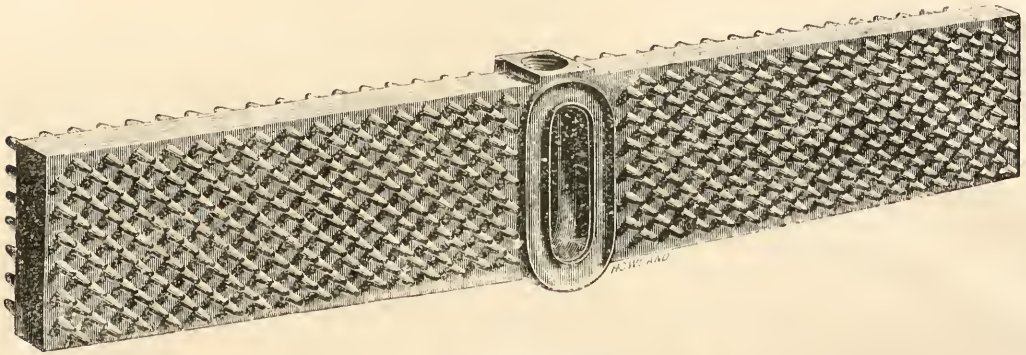
The building is heated by a low pressure steam heating apparatus. There are two tubular wrought-iron steam boilers in the basement, which may be worked conjointly or separately. One is supposed to be sufficient for all ordinary winter weather. There are in the basement connected with these boilers, twenty-six stacks of steam radiators, each in a separate air-chamber. Each school-room is connected with two of these hot air-chambers by means of tin pipes and registers located on its two weather sides. The hall is also connected with two of a large size. Cold out-door air is conveyed by means of ventiducts to each hot air-chamber where it is moderately warmed by being *strained* through the stack of radiators [see accompanying cut] and thence passed to the school-rooms. The radiators are of cast-iron; the whole number of them is four hundred, with aggregate of four thousand feet of radiating surface.

The pressure of steam on the boilers sufficient for heating purposes varies from *three* to *five* pounds to the square inch. As fast as the steam is condensed, it is returned to the boilers in the form of warm water, and hence, it is only at intervals of two or three weeks, that it is necessary to replenish the boilers with cold water.

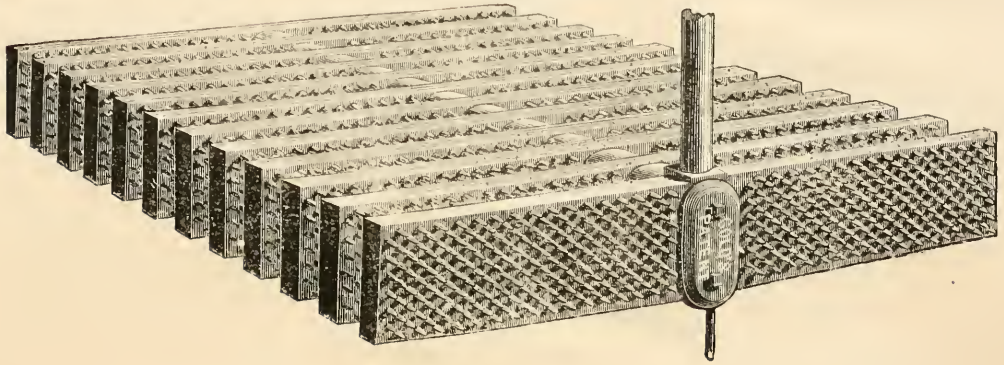
The plan of ventilation is in some respects different from that in any other school building in the city. Each school-room is provided with a separate ventiduct 16 by 16 inches in the clear, constructed of smoothly planed boards, with two valves opening into it, one near the floor and the other near the ceiling. These valves are about 16 by 24 inches. The lower one is to be kept open for ordinary ventilation; the upper one is designed to be opened when there is surplus heat to be expelled. The ventiducts, although connected to the rooms by the valves just described, are located in the several clothes-rooms, and are extended up into the roof; from thence the foul air escapes through one large ejector placed at the highest point of the roof. To further assist in the ventilation of the school-rooms, cloak-rooms and halls, swivel blinds are placed over all the doors, and movable glazed sashes are inserted in the partitions on the hall side of the cloak-rooms, so that a full and free discharge of air from the school-rooms may be effectual without a draught, the air passing out of the school-rooms rises up through the well-rooms of the stair-cases, and through openings in the attic ceiling to the ejector on the roof.

All of the walls and partitions are constructed with bricks, the exterior walls are faced with pressed bricks. The trimmings of the doors and windows, the basement up to the level of the first floor, the belt course at the height of the second floor, and the tablet over the front entrance, on which is the name of the school and the date of erection in bold raised letters and figures, are all of white Con-

RADIATOR.



STACK OF RADIATORS.



cord granite. The cornice is of wood, with copper gutters. The roofs are covered with slates and tin, the Mansard roof is covered with an ornamental cast-iron snow guard. The yard is enclosed by a handsome iron fence on the D and Fifth street sides, and by a brick wall eight feet high on the other two sides.

The accompanying perspective view shows the external appearance of the edifice. It is compact in form, and is solid and substantial in character, rather than pretentious and showy. The excellence of the materials used in its construction, and the thoroughness of the work in every particular from "turret to foundation stone," may be appreciated to some extent by reference to the specifications in detail which follow this description.

William Sayward was the contractor for the mason work, Messrs. Morrison & Shaw were the contractors for the carpenter work, Messrs. Geo. W. Walker & Co. for the heating apparatus, and the furniture was made by Joseph L. Ross. All these contractors have reason to point with pride, as skilful and honest mechanics, to their work on this building. In material and workmanship it is probably unsurpassed by any other school edifice in this country. The whole cost, exclusive of the lot, but including furniture, is about $85,000.

The honorable ex-mayor (Otis Norcross) whose name the school is hereafter to bear, has given to it, besides a large clock for the hall, and a library of reference books costing $100, the sum of $500, the interest of which is to be expended annually for the purchase of such library and reference books as the Chairman of its Committee, and the Master may deem most desirable.

STATISTICS &c., OF THE PUBLIC SCHOOLS OF BOSTON.

	1853-54.	1866-67.
Valuation of real estate	$127,730,200 00	$225,767,215 00
Personal estate	99,283,000 00	189,595,130 00
Total	227,013,200 00	415,362,345 00
Total expenditure for public schools	273,251 75	781,280 60
Viz: for salaries of teachers	192,704 05	492,796 66
Incidental expenses	57,960 46	186,908 85
School-houses	22,587 24	101,575 09
Cost per scholar	11 12	27 90
Salary of superintendent	2,500 00	4,000 00
" (3) high school masters (2d year),	2,400 00	4,000 00
" (5) " Sub-masters "	1,800 00	3,000 00
" (9) " Ushers "	1,500 00	2,200 00
" (22) Gram. school masters "	1,800 00	2,800 00
" (15) " Sub-masters "	1,200 00	2,200 00
" (9) " Ushers "	900 00	1,600 00
" (279) Assistants Gram. Sch. "	300 00	650 00
" (259) Prim. school teachers "	300 00	650 00
" Teachers of sewing (12 in all) average	200 00	387 00
" Teachers of Music (in primary school		2,500 00
" " Vocal and physical gymnastics		4,800 00
" " Drawing		1,800 00
Total number of Teachers — male		67
" " " female		563
" " Pupils		28,126
Assessor's valuation of school-houses and grounds		$1,673,600 00

PLANS OF SCHOOL-HOUSES IN NORWICH.

NORWICH FREE ACADEMY.

The Norwich Free Academy represented on pages occupies one of the most eligible sites in the world,—a lot of over six acres perfectly level in front, and rising into a beautifully wooded hill in the rear, commanding a fine view of the city and surrounding country.

The building was erected after plans by Mr. Evan Burdick, Architect, Norwich, at a cost of $30,000 exclusive of the land.

The building is 87 feet with a front projection of 24 feet by 12, surmounted by an Observatory.

In the Basement, besides the furnaces and the coal-bins, there is a working laboratory, connected by stairs with the philosophical lecture room on the first floor.

On the first floor, besides separate clothes room, one for boys, and the other for girls, there is a Lecture room, and a Library, for the supply of which, Gen. Williams and wife have given a fund of $5,000.

The Second and Third floors are now left, each in a single hall with two class rooms attached, but are capable of being subdivided into two rooms, if the organization of the Academy should require it.

For convenience of access, for spaciousness of halls and class rooms, for light, warmth, ventilation, and seating, for the accommodation and use of apparatus, and library, this edifice is not surpassed by any other erected for educational purposes within our knowledge.

CENTRAL DISTRICT SCHOOL.

This building represented on pages was erected by the Central District of Norwich to accommodate a graded system of schools; there being six rooms, thereby accommodating as many classes or departments. The architect was Mr. Evan Burdick.

The building is 76 feet by 58 feet, with a front projection of 14 ft. by 14 ft. The lot is in 150 feet by 280, well graded and drained and enclosed with an iron fence. The rooms are well lighted, warmed and ventilated, and furnished with desks and chairs manufactured by Joseph L. Ross of Boston. The cost of grounds and building was $37,500.

PRIMARY SCHOOL.

In the organization of the public schools of Norwich, the committee contemplate the establishment from time to time of a sufficient number of Primary Schools, to accommodate all the young children in the immediate neighborhood of their homes. The diagram on page 700, represents one of the houses erected for a school of this grade, capable of accommodating 112 pupils divided into two classes or departments. Each room is furnished with Ross's school-furniture.

The material is wood, and the cost independent of the site was $3,000 Mr. E. Burdick Architect.

FREE ACADEMY, NORWICH, CONN.

Fig. 2.—Basement.

A.—Furnace Room.
B.—Laboratory.
C.—Coal Room.
D.—Boys' Play Room.
E.—Girls' Play Room.
a. a.—Stairs.
b.—Area Windows.
c.—Furnaces.
d. d.—Basement Stairs.
e.—Stairs to Laboratory.
f.—Fire Place.
g—Iron Columns.

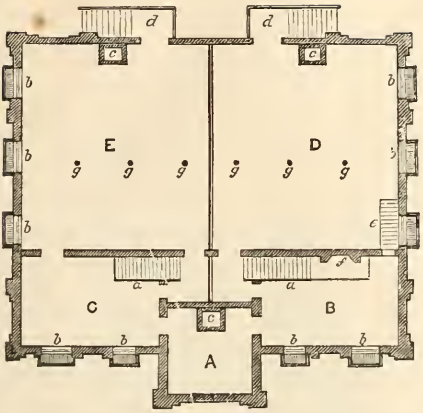
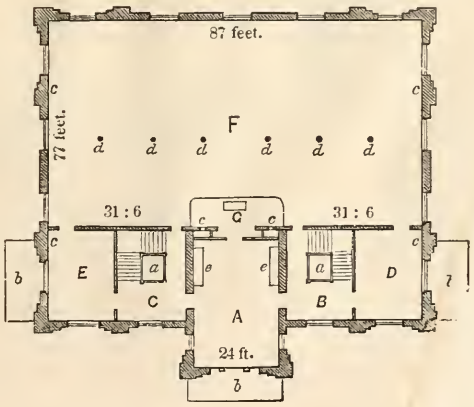


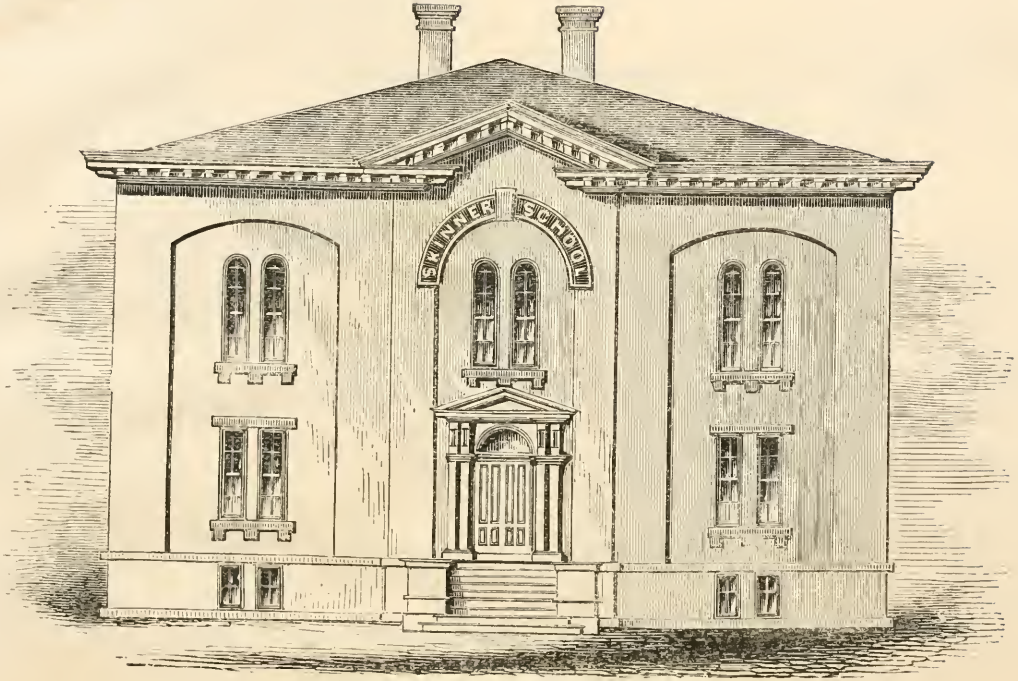
Fig. 3.—First Floor.

A.—Teachers' Entrance
B.—Boys' Hall.
C.—Girls' Ha'l.
D.—Boys' Clothes-room.
E.—Girls' " "
F.—Lecture Room.
G.—Library.
H.—Hall.
I.—Platform.
a. a.—Stairs.
b. b.—Wash-stands.
c. c. c.—Porches.
d. d.—Teachers' Closets.
e.—Laboratory Stairs.
f.—Ventiducts.
g. g.—Seats.
h.—Iron Columns.
i.—Apparatus.
k.—Book Case.

Fig. 4.—Second and Third Floors.

A.—Teachers' Room.
B.—Boys' Hall.
C.—Girls' Hall.
D.—Recitation Room.
E.—Recitation Room.
F.—School Room.
G.—Platform.
a. a.—Stairs.
b. b. b.—Roofs.
c.—Ventiducts.
d.—Iron Columns.
e.—Book Cases.





SKINNER SCHOOL, NEW HAVEN, CONN.
Erected in 1867. Cost, (including lot, $6,900,) $41,9 0.

Plans of School-Houses in New Haven, Conn.

Skinner School.

The Skinner School, named in honor of Aaron N. Skinner, former Mayor, and an earnest friend of public schools, erected in 1867, at a cost of $35,000, including lot, fence, &c., is on the corner of State and Summer streets.

The main building is seventy by eighty-eight feet, and two stories high. Each story is divided into six rooms, with a hall ten feet wide in the centre. There is a projection in front five by twenty-two feet, which, besides extending the hall, gives closets on each side for teachers' clothing and for storing books, maps, &c. In the rear there is an addition sixteen by thirty-six feet, which, besides a recitation-room connected with the principal's room, contains the stairs for the pupils, which being separated from the main building by a wall, will, in case of fire, be the last to be destroyed. The three rooms on each side of the hall are connected by doorways, leaving a passage-way round the entire building, near the outer wall. This plan was adopted for safety in case of fire. The furnaces being all in the centre of the building, fire can only commence there, in which case the teachers and children would find a safe egress through these doors to the protected staircases in the rear. Double doors are placed at these openings, one opening into each room, which prevents noise from adjoining rooms as effectually as a brick wall.

In four rooms on the first floor, a dressing-room six feet wide is formed by running a screen across the room seven feet high, in which the younger children hang their clothing, under the supervision of the teacher. The dressing-rooms for the older children are in the basement, each occupying the space of two school-rooms, as seen in the plan.

There are four furnaces placed side by side in the centre, an arrangement conducing alike to convenience and safety. Each furnace heats three rooms on one floor. The furnaces are supplied with air from a room in the basement of the rear addition, into which air is freely admitted through two windows covered with wire cloth. The air tubes go out at the bottom of this room, and pass under the floor of the dressing-rooms to the furnaces. By this plan all disturbance from outside currents of air is avoided.

The building is ventilated by means of four chimneys, each two feet square inside, up through the centre of which passes a cast iron smoke-pipe, one for each furnace. The rooms are ventilated by registers opening into these chimneys, the heat of the smoke-pipe producing a very strong draft.

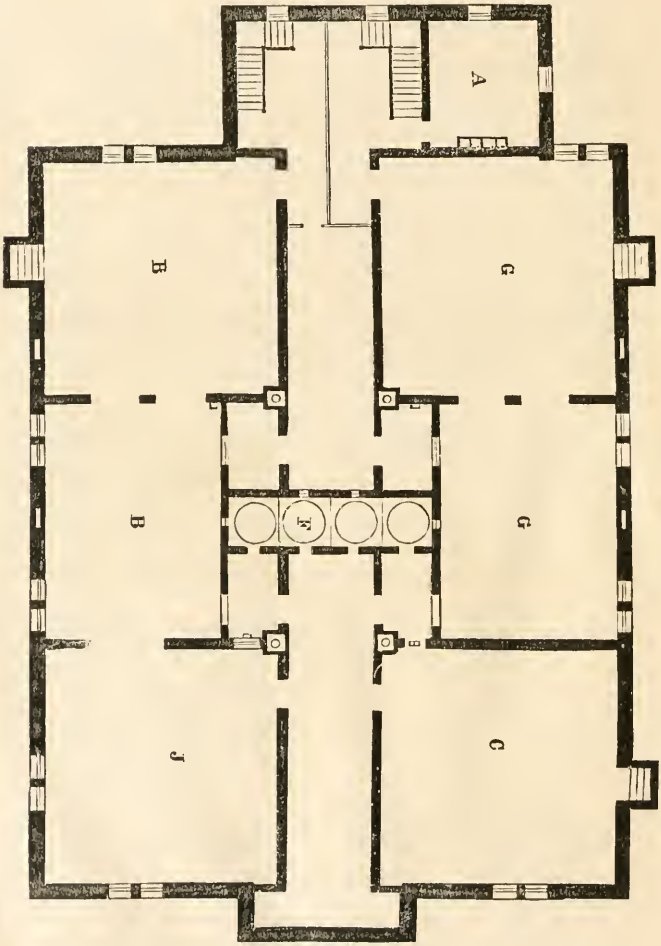
A register from each furnace opens into the hall, by means of which rooms can at any time be cooled off by shutting its register and opening that in the hall.

The street water is introduced into the dressing-rooms in the basement, and into the halls of the first and second floors.

The interior is finished with white chestnut wood, except the floors, which are yellow pine.

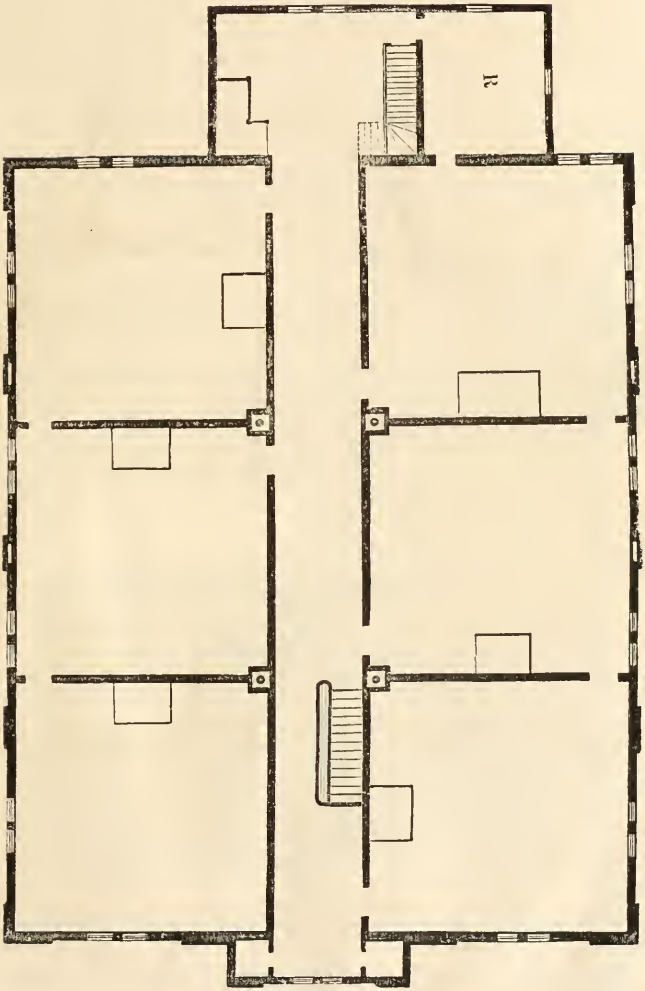
Several important improvements have been recently made in the school buildings of New Haven, making them to conform to the plan of the Skinner School, of a room for only fifty scholars under a class teacher. In the Eaton School, the large rooms on the third floor have been converted into two each. And in the Webster School, two large rooms in the octagon have

been made into four very convenient rooms; and the large room in the second floor of the main building has been divided. This is the final change in the original plan on which the Eaton and Webster Schools were inaugurated, of having large rooms of a hundred or more pupils, with one or two assistants who heard these classes in recitation-rooms adjoining It is now found that better teaching and better discipline is obtained in rooms containing about fifty scholars, entirely under one teacher's control, a system which now exists in all our schools.—*D. C. Gilman's Report for* 1867.



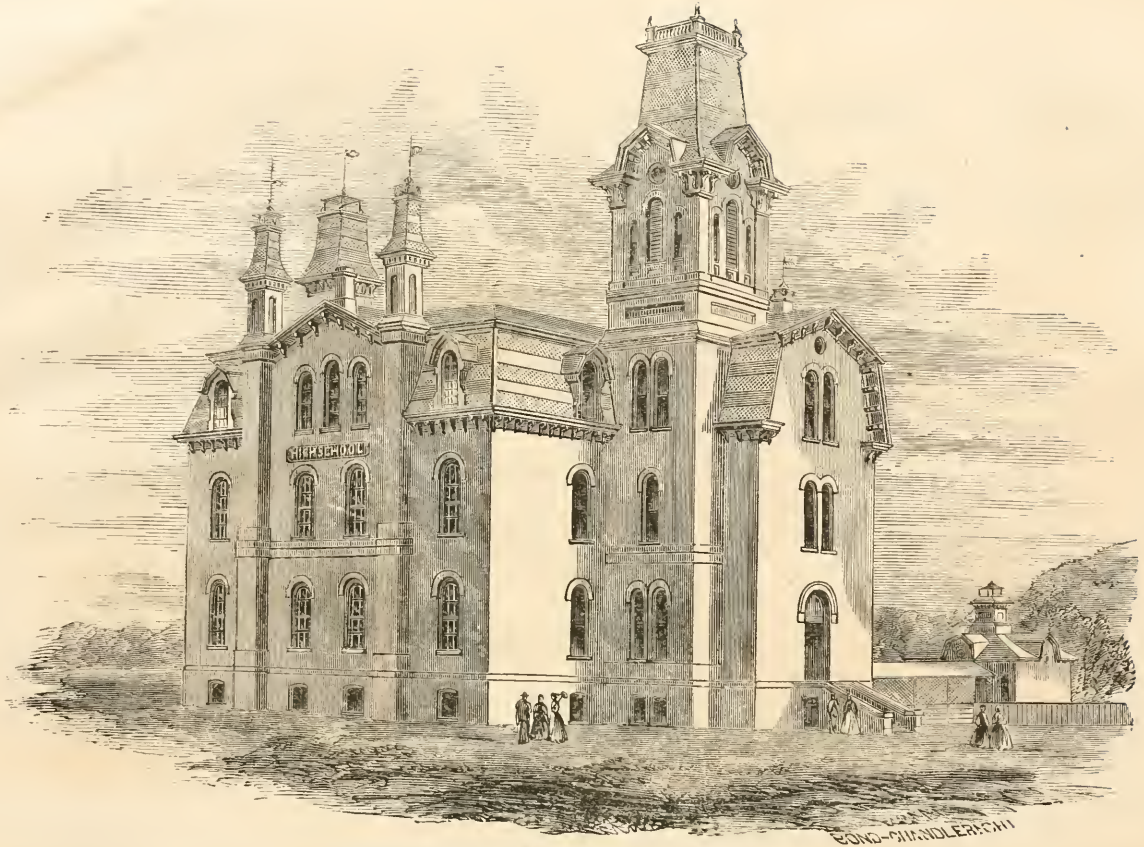
Basement.

A. Air chamber. B. Boys' Clothes room. G. Girls' Dressing room. C. Coal room.
J. Janitor's room. F. Furnaces.



SECOND FLOOR.

R. Indicates a Recitation room connected with the Principal's. All other rooms on this floor are School rooms. The rooms in the first floor correspond.



PUBLIC HIGH SCHOOL, WINONA, MINNESOTA.

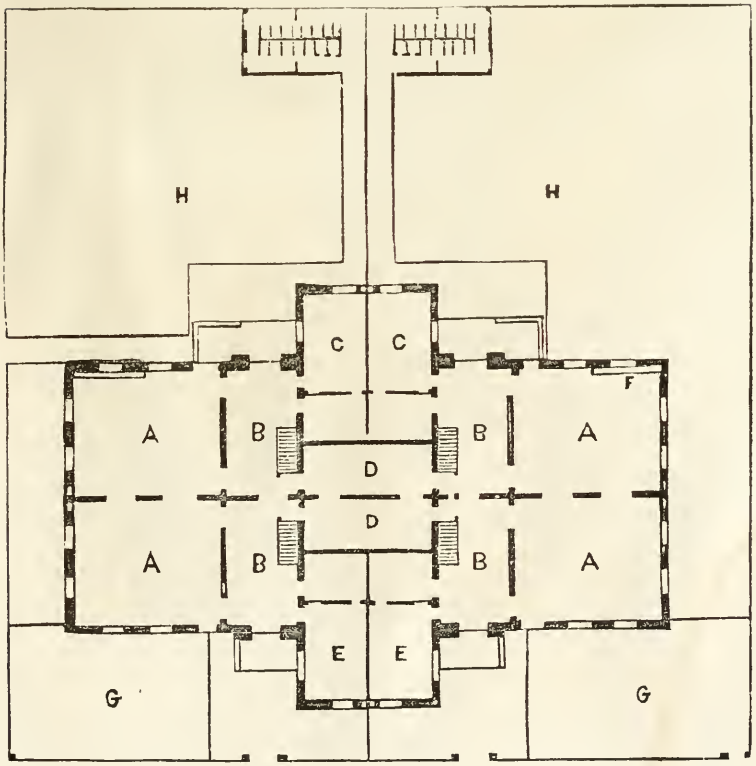
School-Houses in San Francisco.

Lincoln School.

The Lincoln School building was completed in August, 1865, and cost, including furniture, $100,000. It is designed exclusively for boys, and accommodates one thousand pupils, exclusive of the large hall in the attic story. It is situated on the corner of Fifth and Market streets, one hundred and seventy-five feet square, and is inclosed in front by a brick wall and balustrade fence.

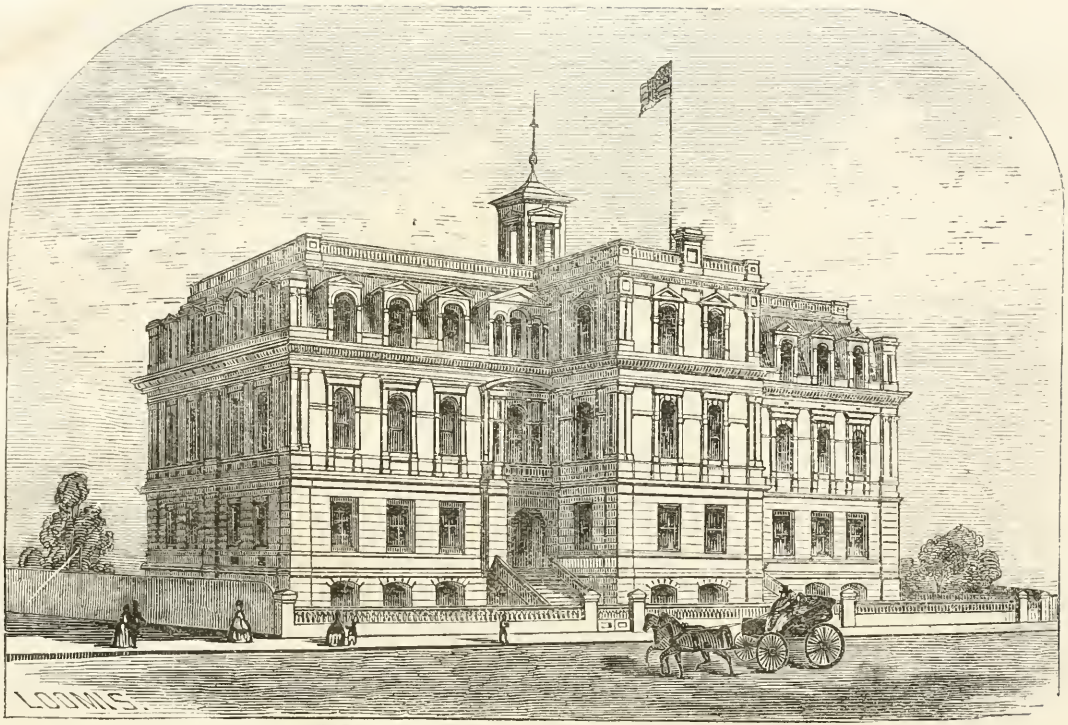
The plan of the building is cruciform, one hundred and forty-one and a-half feet long, by sixty-three and a-half feet wide in the body; the wings are eighteen by thirty-three feet, and the whole covers a superficial area of ten thousand one hundred and thirty-seven feet. It is built of brick, in the most substantial manner, with a basement, two stories, and an attic, terminating with a Mansard roof, which is surmounted by a cupola, and surrounded with a balustrade.

The walls of the basement and principal story are two feet thick; above that, they are eighteen inches thick. The joists of all the floors are three by seventeen inches. The height of the basement in the clear is eleven feet; principal and second stories, fifteen feet; while the attic or assembly hall, which forms one room throughout the building, is eighteen feet in the clear.



Basement and Yards.

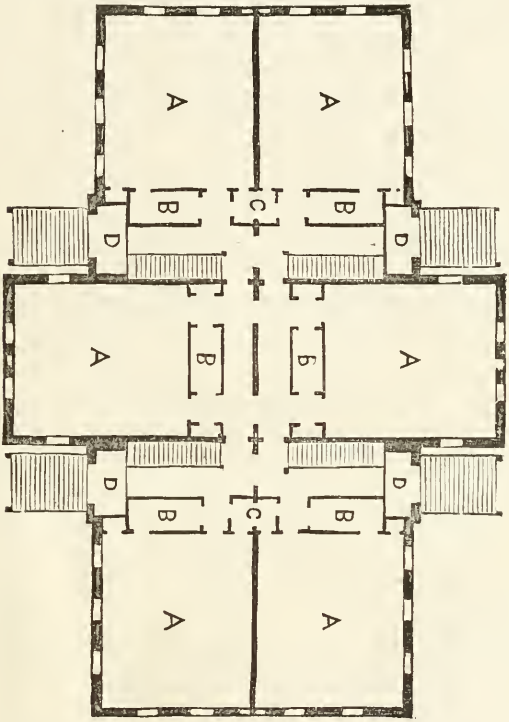
A 1. Boys' gymnasium. A 2. Girls' gymnasium. B Halls. C. Store rooms. D. Furnace rooms. E Janitor's room. H. Girls' yard. F. Lavatories. G. Front yards. H. Boys' yard.



LINCOLN SCHOOL FOR BOYS, SAN FRANCISCO, CALIFORNIA.

Erected in 1865. Cost, $100,000. 1,000 seats.

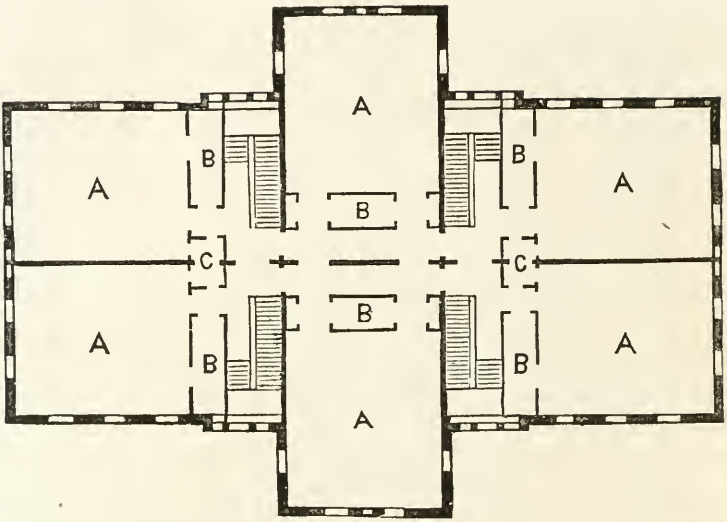
Four capacious stairways communicate between the basement and the attic. The ingress and egress to the building are very ample, safe, and convenient, and consist of ten large doorways—four in front, just at each side of the main building, and six in the rear, four of them corresponding with those in front, giving an extent for these purposes of seventy-two feet in breadth.



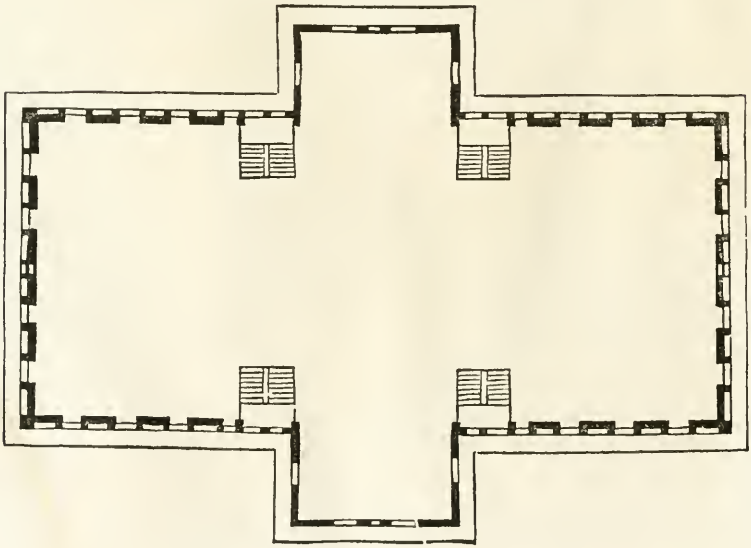
First Floor.
A. Recitation rooms. B. Wardrobe rooms. C. Teachers' rooms. D. Vestibules.

The interior is well lighted and ventilated throughout. The windows are glazed with ground glass, which dispenses with curtains and blinds Fresh air is introduced through the apertures near the doors, which are regulated by registers, while the impure air escapes through ventilators near the ceiling.

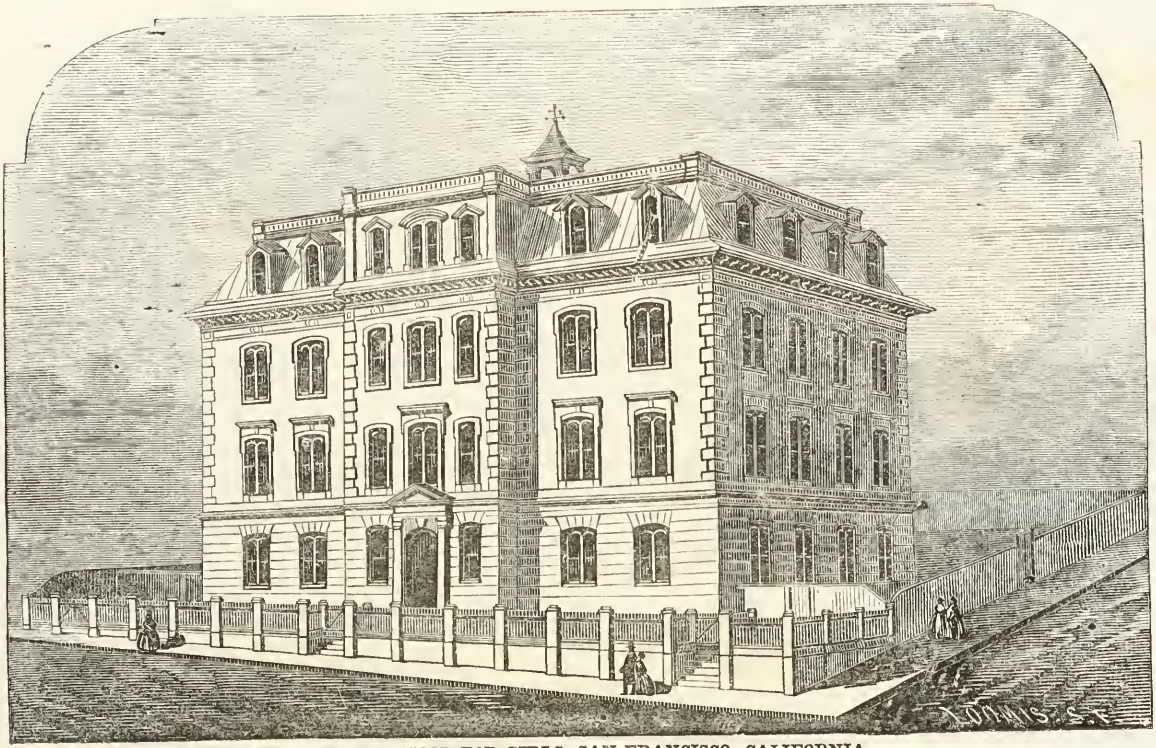
The distribution of area on the principal and second floor is uniform, each containing six school-rooms of twenty-nine by thirty-four feet; six wardrobe rooms, six and a half by twenty and a half feet; two teachers' rooms, six and a half by nine feet; and two halls, eleven feet four inches wide, running through the building transversely, with stairways at each end, reaching to the attic or assembly hall. The attic is in one room, but is capable of the same arrangement as the stories below. The basement contains six school-rooms, which accommodate sixty pupils each. All the wardrobe rooms are supplied with marble top wash-stands and water.



SECOND FLOOR.



ASSEMBLY HALL.



DENMAN SCHOOL FOR GIRLS, SAN FRANCISCO, CALIFORNIA.

Erected 1864. Cost, $78,000. 600 seats.

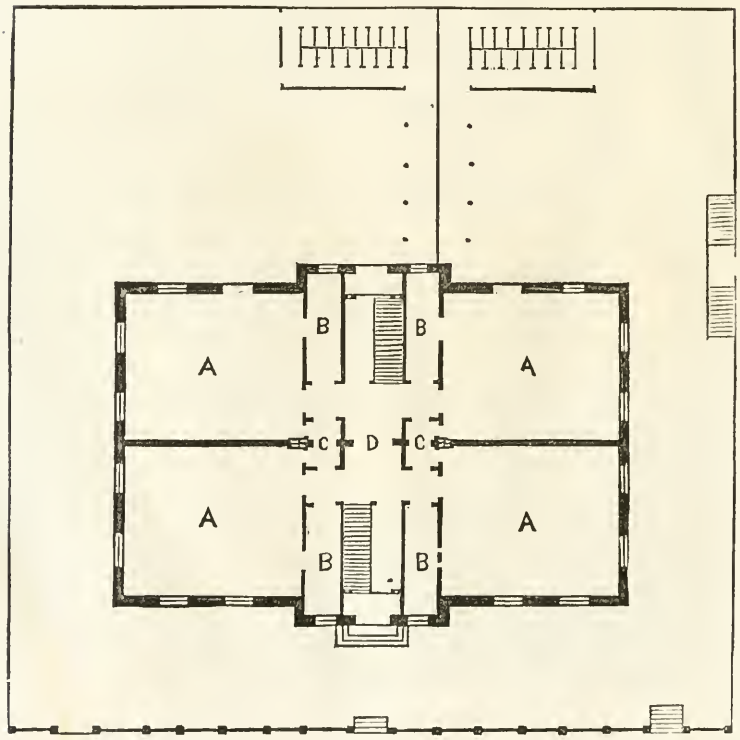
DENMAN SCHOOL-HOUSE.

The Denman School building was erected in 1864, at a cost of $78,000, including furniture, and bears the name of the teacher who founded the school in 1851, was afterwards City Superintendent, and Principal of the school. It is designed exclusively for girls, and accommodates six hundred pupils.

The plan of the building is a parallelogram of ninety-eight and a half feet by sixty-one feet, having its entrance on the long sides, in projecting portions, each twenty-nine feet by three and a half feet.

The building is three stories high, the first being thirteen and a half feet, and the second and third stories, each fifteen feet high, besides the attic, which is twelve feet high, and contains sixteen Luthern windows in its inclined sides, and six in the projecting portions of the two fronts.

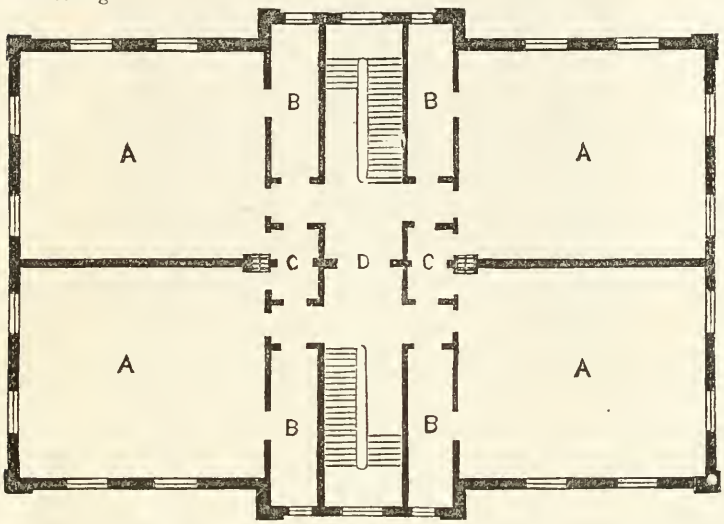
The distribution of the first, second, and third stories is uniform, each containing four school-rooms of twenty-eight by thirty-four feet; four wardrobe rooms of six and a half by twenty-one and a half feet; two teachers' rooms of six and a half by nine feet; and a hall, eleven feet wide, through the centre of the building, transversely, with easy, spacious stairways at each end, which extend to the attic and discharge below by four spacious doors.



Basement and Yard.

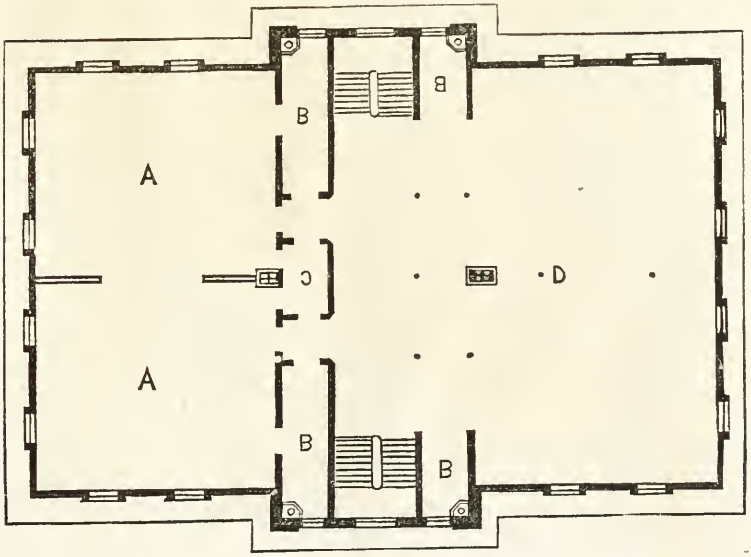
The attic contains two recitation rooms, each twenty-seven by thirty-three and a half feet, and an assembly room capable of accommodating the entire school.

Fresh air is introduced through apertures near the floor, and regulated by registers, while the vitiated air is allowed to escape through ventilators near the ceiling.



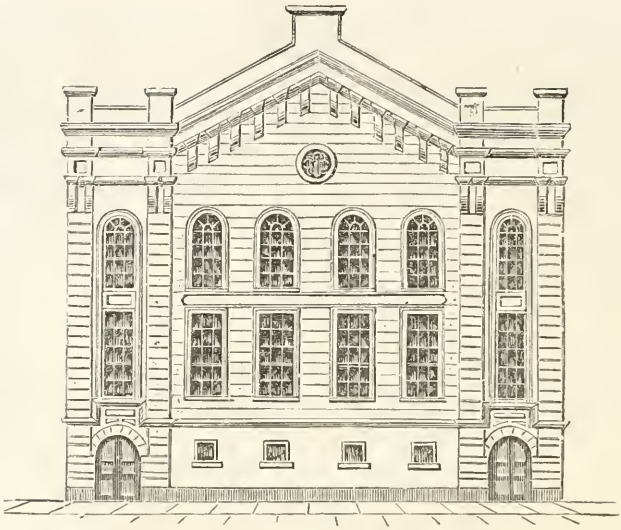
First, Second and Third Floors.

A A. Recitation rooms. B B. Clothes rooms. C. C. Teachers' rooms. D. Hall.



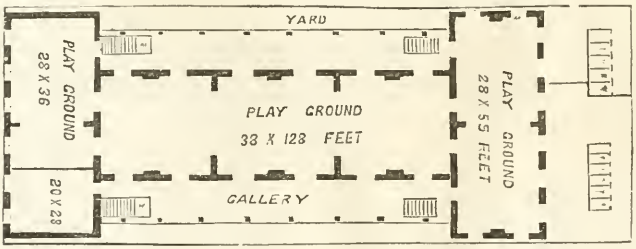
Attic.

A A. Gymnasiums. D. Assembly Hall. B B. Clothes rooms. C. Closets.

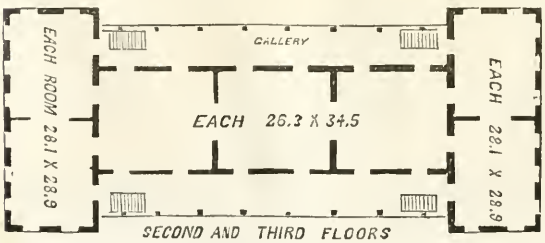


PLAN OF ST. PHILIP SCHOOL, NEW ORLEANS, LA.

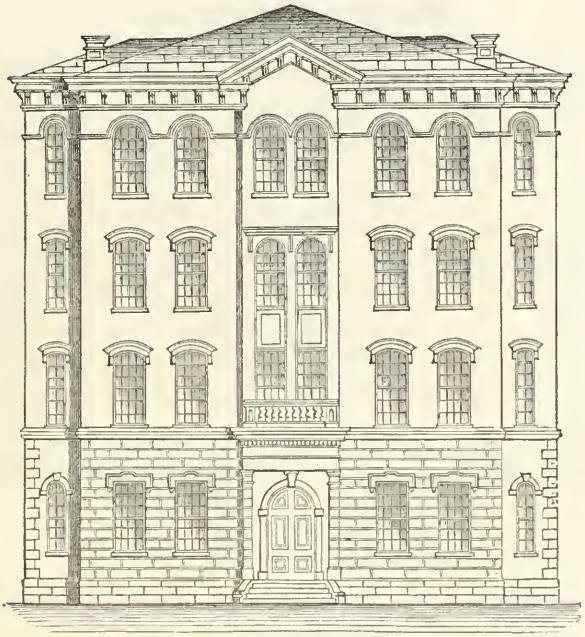
ST. Philip Public School for Boys is situated in Second Municipality, on St. Philip street. The building is 57×159 feet—two stories, and a basement, which is used with the yard for exercise. There are fourteen rooms, six of which are 34. 5×26¼, and eight are 28¾×28.1—all furnished with the best style of seats and desks.



FIRST FLOOR.



SECOND AND THIRD FLOORS



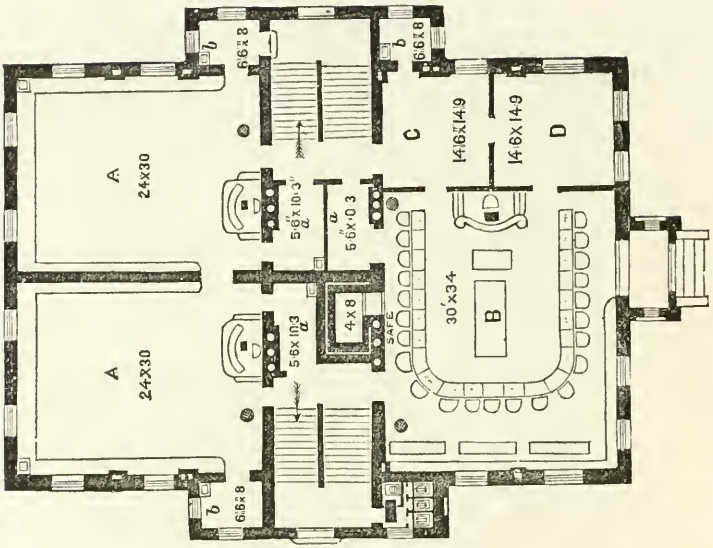
PLAN OF GRAMMAR SCHOOL, LOUISVILLE, KENTUCKY.

THE outside dimensions of the Public School-house on the corner of Centre and Walnut streets are 52 feet front by 77½ feet deep, with a wing on each side for stairs, closets and halls, 7½ by 34 feet deep. On the first floor, besides an office for the Board of Trustees, (B,) the Superintendent, (C,) and Secretary, (D,) there are two school-rooms, (A,) 24×30, with a pupil cloak-room 5½×10 feet, and a teachers' room 6½×8 feet attached. On the second and third floor are four rooms of the same size, with similar small rooms attached, and on the fourth floor are two school-rooms, (A,) and one large hall, (D,) capable of being enlarged to the additional capacity of the school-rooms by sliding the partitions into the walls.

Around three sides of each school-room is a raised platform for recitations, and on the fourth for the teacher. Into the walls, in the place of blackened or other prepared dark surface, are set large slates for demonstrative exercises.

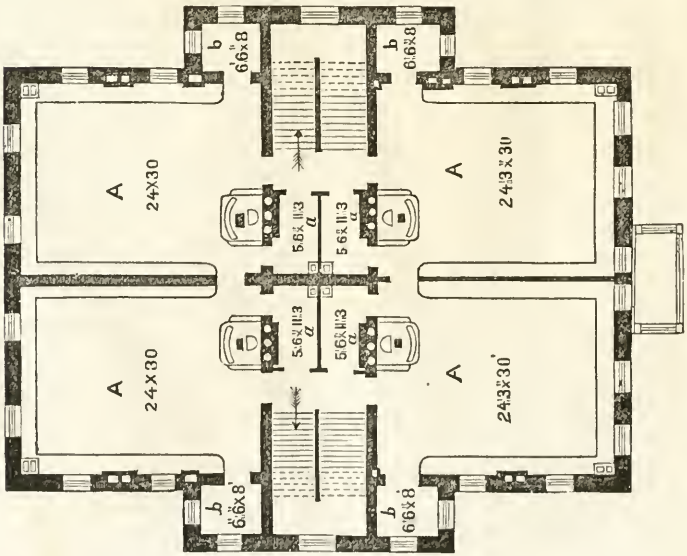
Each story is supplied with pure air, water, and every requirement of comfort, cleanliness and health, and security against fire or panic. The stairs are on each side of the building, running up half way to a platform, and thence to the floor above, with solid partitions dividing the different flights—preventing sliding, and danger from pressure.

It is built of brick, with stone trimmings, slate roof, and galvanized iron cornice, and furnished with the best style of seats and desks, at a cost of $45,000, exclusive of lot valued at $12,000.

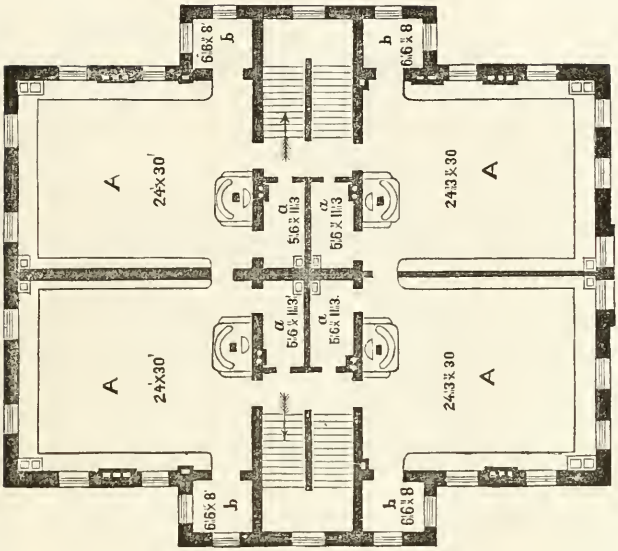


First Floor.

A. School-room. B. Trustees' room. C. Superintendent's office. D. Secretary's office. *a*. Pupils' cloak-room. *b*. Teachers' room.

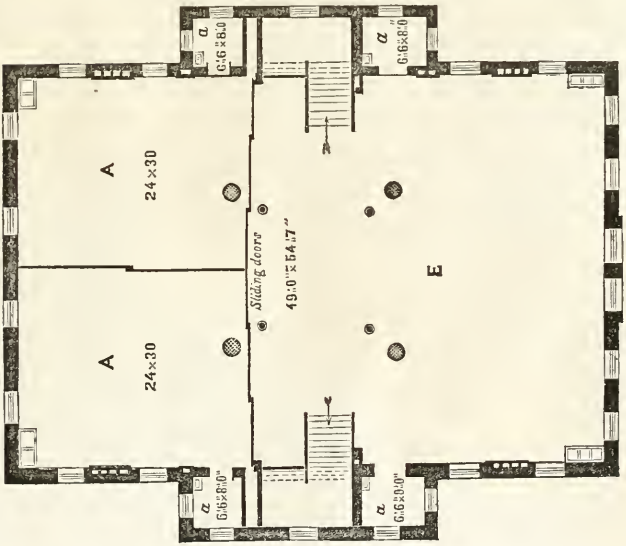


Second Floor.

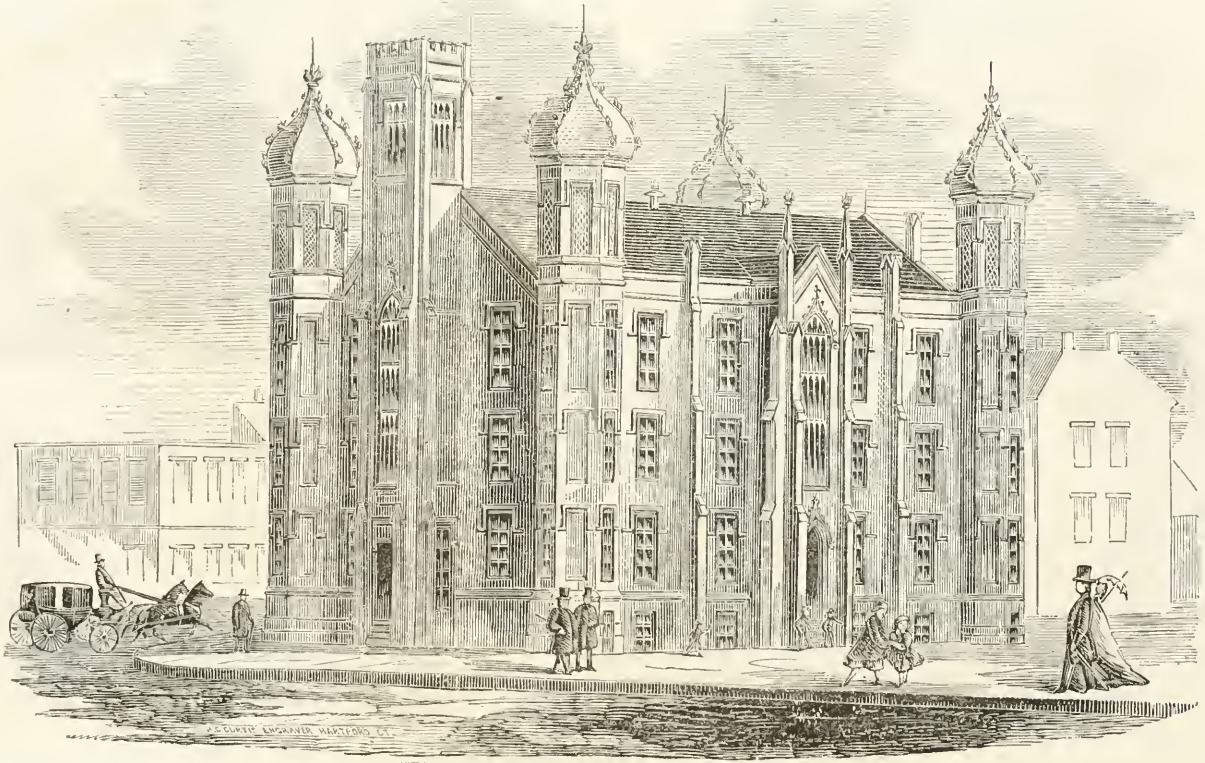


THIRD FLOOR.

A. School-room. *a.* Pupils' sink-room. *b.* Teachers' room.
E. Assembly room, enlarged by sliding partitions.

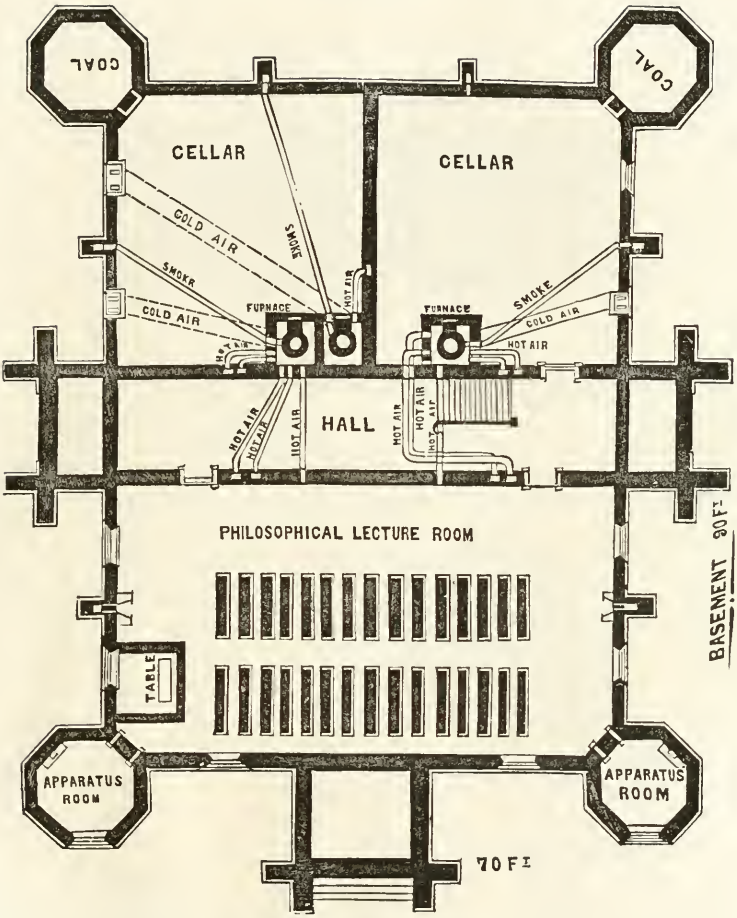


FOURTH FLOOR.



PUBLIC HIGH SCHOOL, ST. LOUIS, MISSOURI.

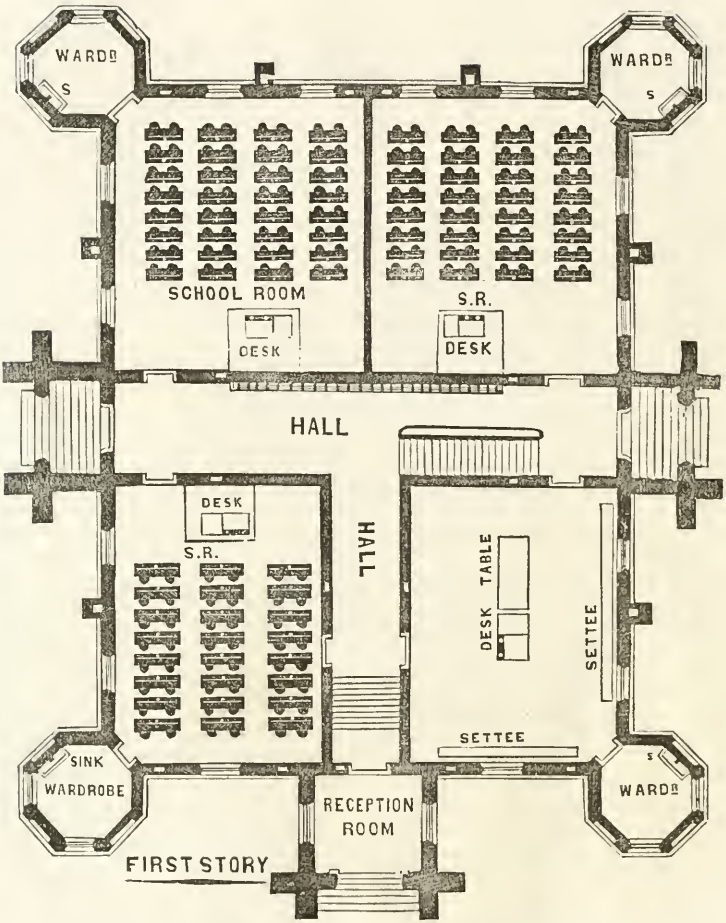
Fig. 1.



PLANS AND DESCRIPTION OF THE BUILDING DESIGNED FOR THE PUBLIC HIGH SCHOOL OF ST. LOUIS, MISSOURI.

THE building in its extreme length is one hundred and six feet; and in its extreme width eighty-four feet, including towers and transepts. The body of the building is eighty-four feet, by sixty-seven; main height seventy-one feet; and to the apex of the roof eighty-six feet. Front square tower, used respectively in each story for reception room, library, museum, and astronomical observatory, is one hundred and six feet high. Octagonal tower flanking each corner, is one hundred and two feet high. The wings or transepts on the sides, are thirteen by seventeen feet, with large gothic windows, seven by thirty-four feet. A similar window is in the large square front tower. All the windows have large cast iron hood moldings painted in imitation of stone; buttress caps, string courses, and wall copings, also of cast iron, and finished in the same manner; the roof is covered with slate, with copper gutters.

Fig. 2.



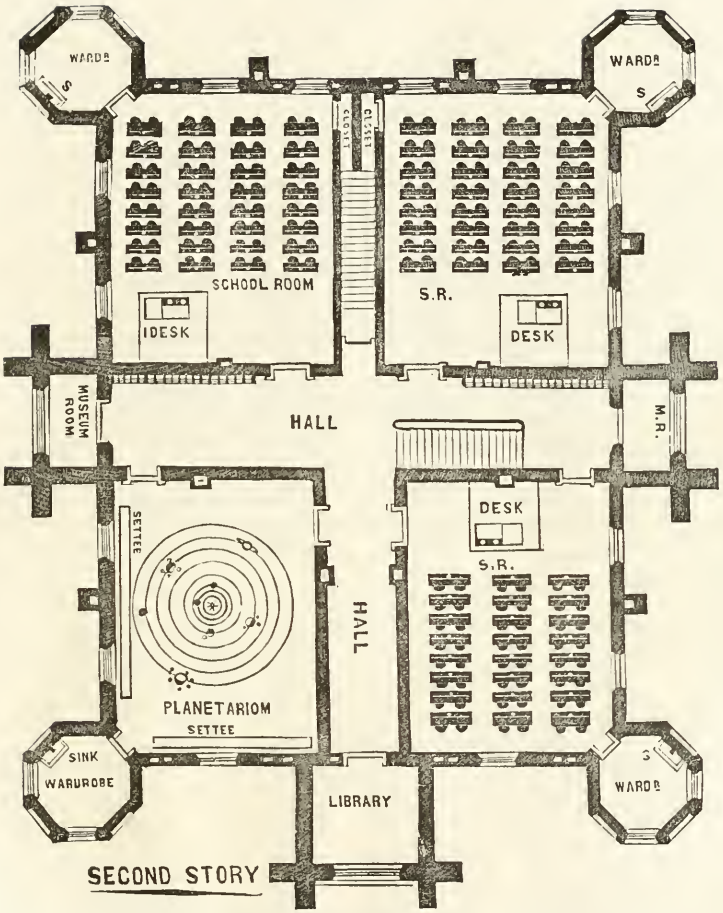
Transverse and longitudinal halls, divide the first and second stories into four rooms each, and each room is capable of accommodating seventy scholars.

The desks are supported in an entire new style, by means of a cast iron peristyle, with large pedestal and four claws for screws. The peristyle is placed in the centre of the desk, adding much to the comfort, cleanliness, quiet, and free ventilation of the room. The desks are made of cherry and varnished. The chairs, which are on the arm chair fashion, are supported similarly to desks, move on a pivot so as to turn one-quarter way round, and the iron work of both desk and chairs are neatly bronzed.

Wardrobe rooms in the towers, are attached to each school-room, with hydrant, and iron sinks for washing and drinking purposes.

The philosophical and chemical lecture-room in the basement, is sixty-one feet by thirty-one feet, with apparatus rooms in towers, with sinks and water; also,

Fig. 3.

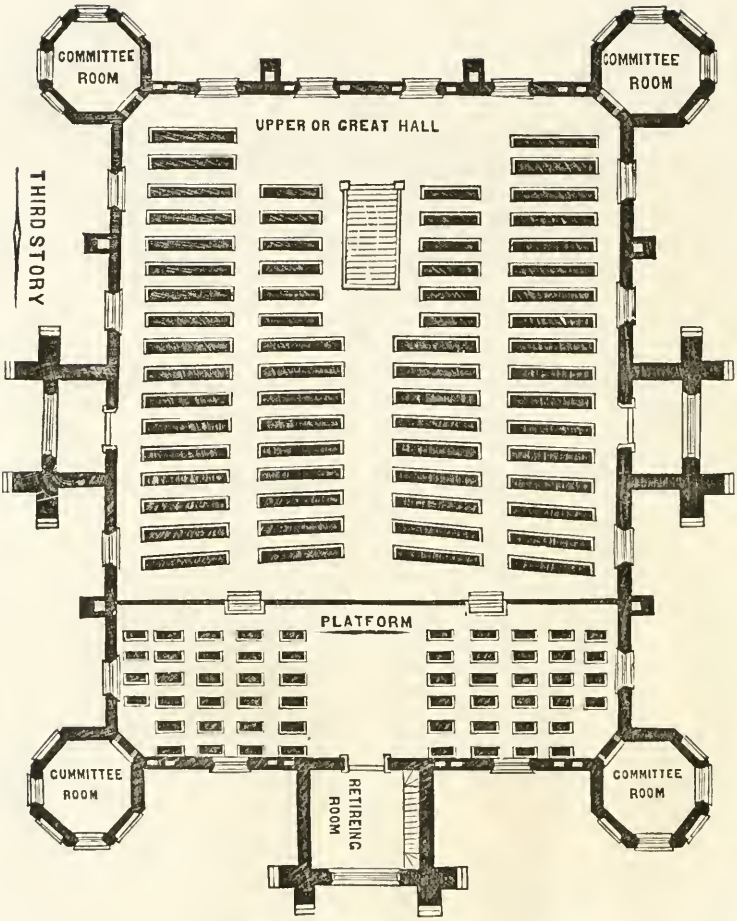


two fire places at each end of the room for experiments in chemistry and philosophy There are stairs leading directly to the philosophical and chemical lecture-room. The other basement is used by three furnaces for heating the building.

The upper, or great hall in the third story, being the full size of the building, is large and commodious, capable of accommodating six hundred persons. A large platform, twenty feet deep, and the width of the building is at the south end of the hall, to be used by scholars on examination day, and for recitation, declamation, and reading their exercises; also, for a stand for lecturers. There is a retiring room behind the platform in the front tower, for scholars to prepare themselves for performing respective parts in dialogue, &c. From this retiring room a flight of stairs ascends to the astronomical observatory.

The rooms in the octagonal towers of the third story are intended for committee

Fig. 4.



rooms for directory, or for private conference of teachers and parents, or friends, at general exercise, or on examination day. There are two museum rooms in the second story of the transepts, one for males and the other for females.

The entrance or reception room, for strangers and parents, is in the first story of the observatory, or front square tower on Olive street. Over the reception room is the library room. Perfect and thorough ventilation is aimed at, and the latest improvements to attain it, adopted. The stairs are broad and direct, giving free and easy access to, and from the building at all times, and securing against all accidents in case of alarm of fire, &c.

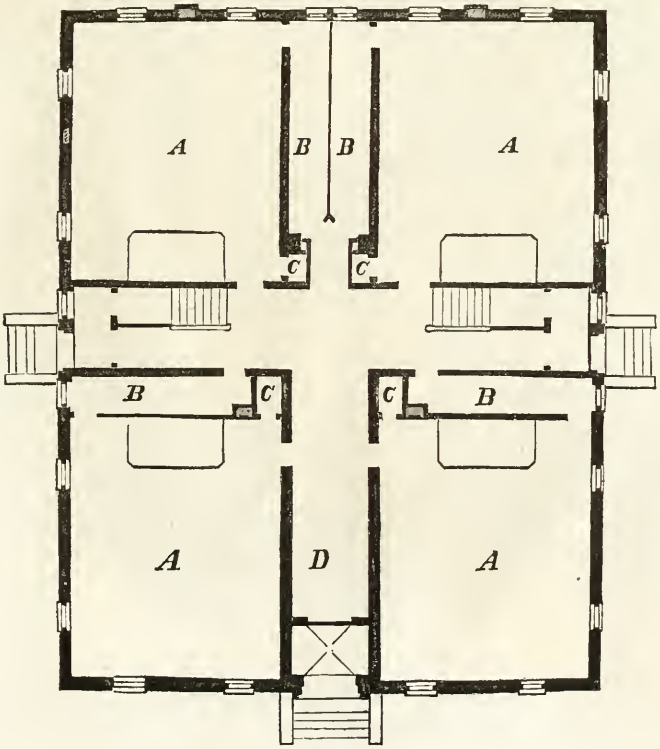
All the finishing of the school-rooms and halls, are grained oak, and varnished. Wardrobe rooms are to be supplied with double clothes' hooks; halls with umbrella racks, troughs, and places for overshoes, all made of cherry and varnished.

Plan of the Wells School, Chicago.

The Wells School building, so called in honor of William H. Wells, the former Superintendent of Schools, is located in the West Division, three miles from the Court House, near the centre of a lot having a frontage on Reuben street of two hundred and fifty feet, and a depth of one hundred and eighty-three feet on Cornelia street. It will accommodate nine hundred and forty-five pupils, distributed through fourteen rooms, each furnished with sixty-three single seats and desks. Total cost, $45,575.00.

The building is 69 × 87 feet on the ground, four stories besides the basement, each floor being divided by a corridor (D) into four rooms (A) 27 × 33 feet each, having a wardrobe (B) for the pupils and a teachers' closet (C) attached, except the fourth floor, which has two rooms of the same character, and an assembly hall (E) 65 × 23 feet in area.

The school-rooms are wainscoted five feet and the wardrobes seven feet high, grained and varnished. Every room is ventilated by large shafts in both the exterior and interior walls, and is warmed by a low pressure steam apparatus, the boiler being located in a separate building in the rear.

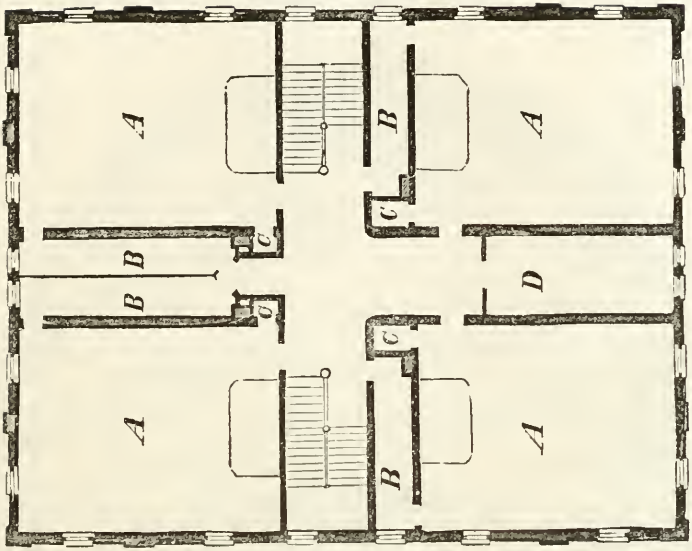


First Floor.

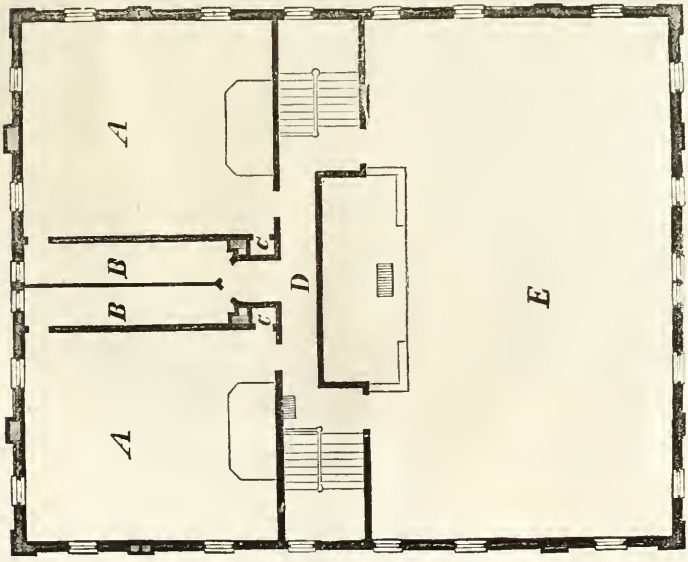
WELLS SCHOOL, CHICAGO, ILLINOIS.

Erected 1866. Cost, (exclusive of lot,) $43,423.) 945 seats.

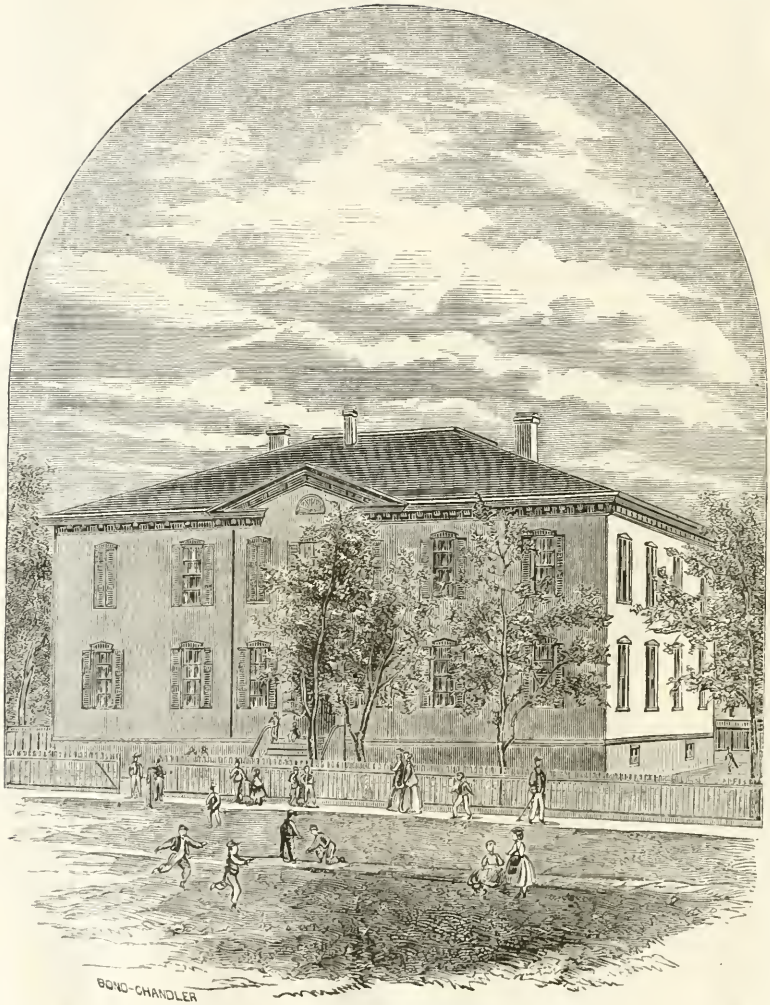
WELLS SCHOOL, CHICAGO.



SECOND AND THIRD FLOORS.



FOURTH FLOOR.

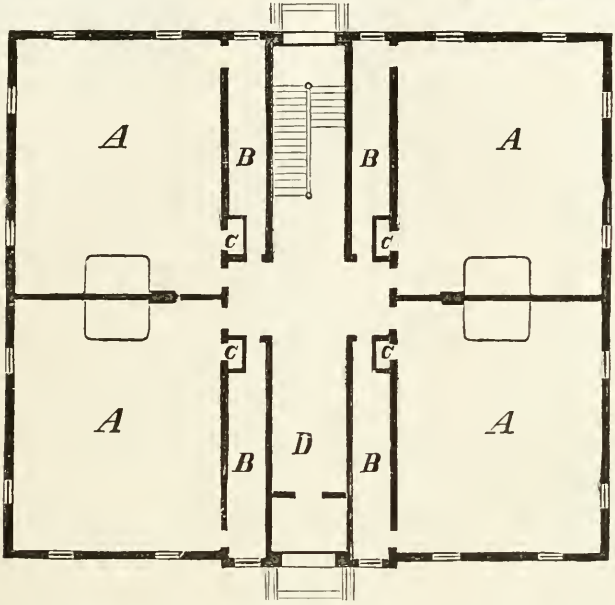


COTTAGE GROVE SCHOOL, CHICAGO, ILLINOIS.

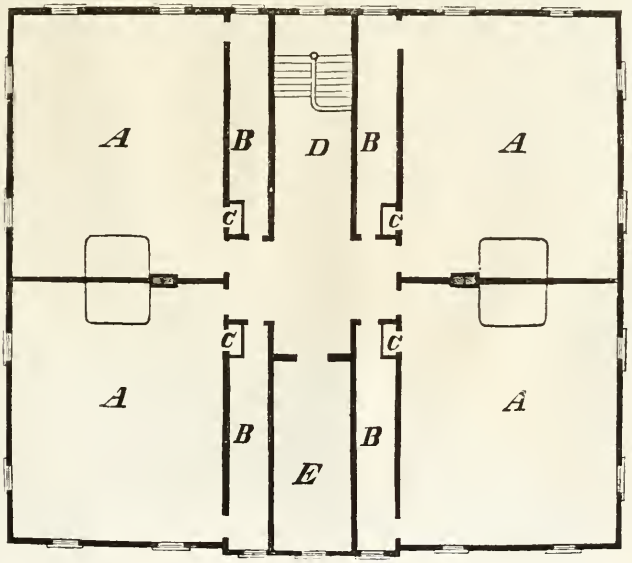
Erected 1867. Cost, (exclusive of lot,) $17,674.92. 448 seats.

PLAN OF COTTAGE GROVE SCHOOL, DOUGLAS PLACE, CHICAGO.

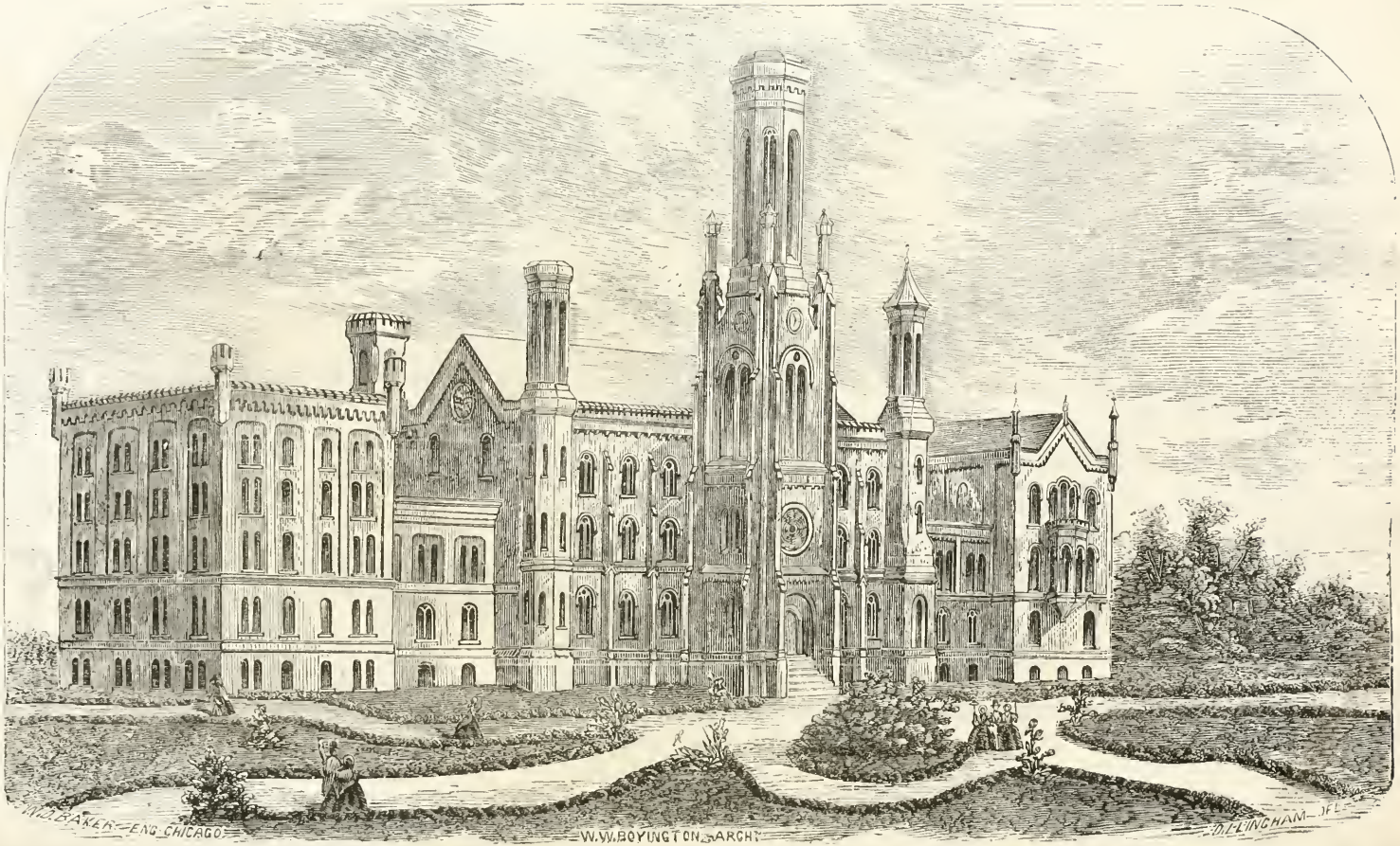
THE Cottage Grove School building, erected in 1866–67, is located on Douglas Place, near Cottage Grove Avenue, in the centre of a lot 200 × 231 feet, finely shaded by native forest trees. Total cost, (including lot, $6,400,) $24,094.92.

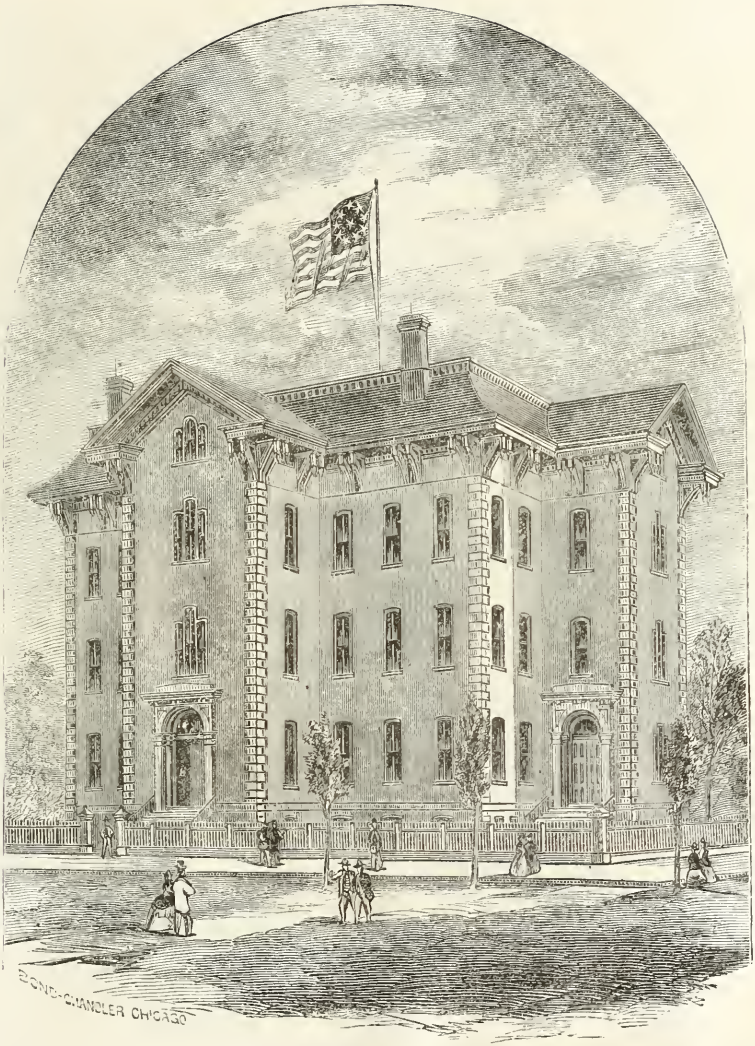


The building is of wood, two stories high, 77 × by 68½ feet on the ground, with four school-rooms, (A) each 27 × 33 feet, with a wardrobe (B) attached, 5 × 27, and teachers' closet, (C) on each floor—and a reception room (E) in front on the second floor, 10 × 23 feet. Each room is provided with single seats and desks; and the whole is heated by one Lawson furnace and four stoves.

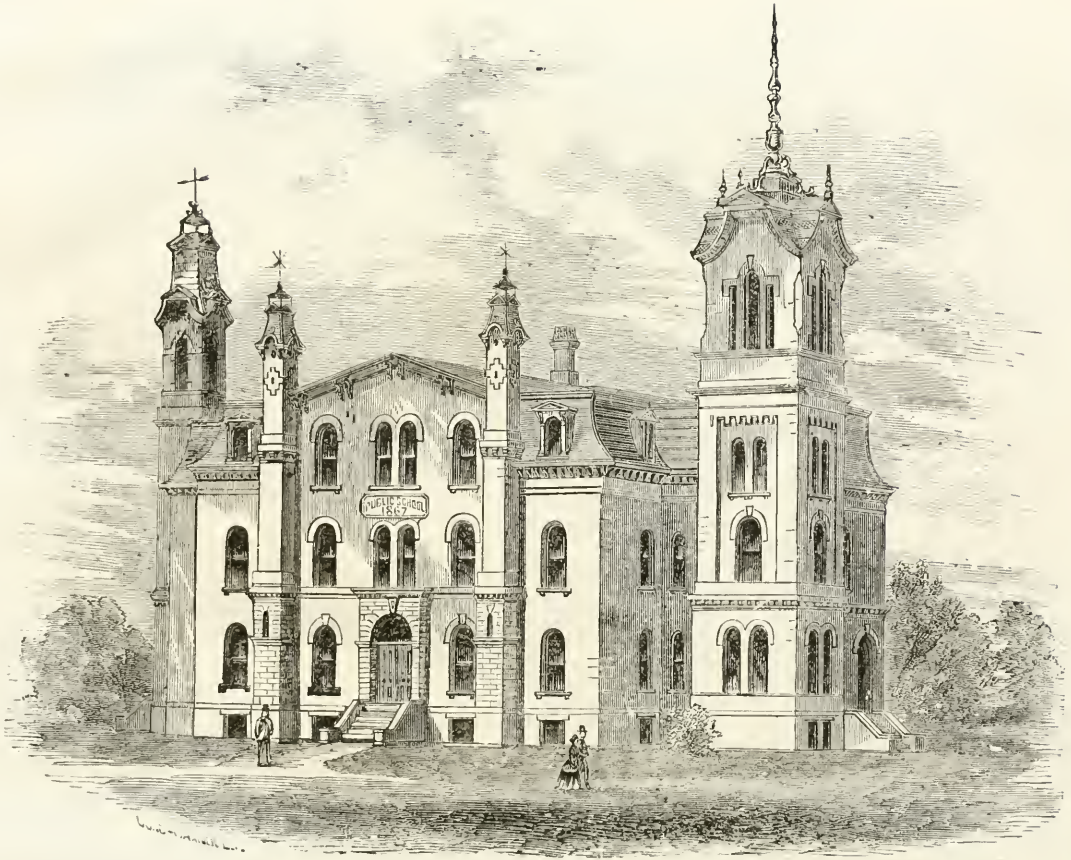


SECOND FLOOR.


W.W. BOYINGTON, ARCHT.



PUBLIC HIGH SCHOOL, SPRINGFIELD, ILLINOIS.



PUBLIC HIGH SCHOOL, MARSHALL, MICHIGAN.

PLANS AND DESCRIPTIONS OF UNION SCHOOL HOUSE, YPSILANTI, MICHIGAN.

THIS edifice stands in the center of a beautiful square in the central part of the city of Ypsilanti, one of the most attractive, healthy and flourishing towns in the State of Michigan. The building has a transept of 120 feet and a depth through the transept of 95 feet, and through the end compartments of 68 feet. The first story of the building which is 20 feet high in the clear, contains a large room, 90 by 45 feet, used for public exercises, chapel, &c., four primary school rooms, with necessary clothes rooms, and two main transverse corridors, running entirely through the building, each 12 feet wide. The large room is a clear and uninterrupted space, without column or pillar of any kind to intercept the view.

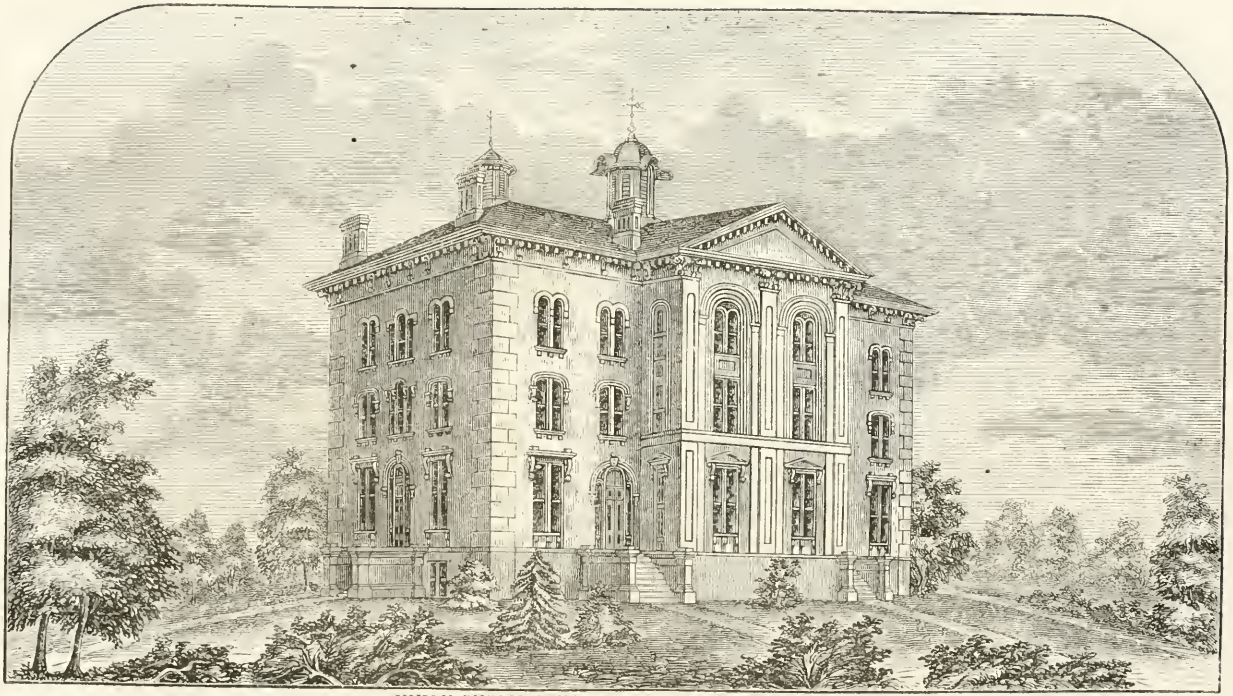
The second story contains one class room 45 by 41 feet--two other class rooms, each 41 by 22 feet, four recitation rooms, library, apparatus room and necessary clothes room. In this story the main corridor, 8 feet wide, runs longitudinally through the building, lighted at each end by a triplet window.

The third story contains one class room 45 by 41 feet, one do. 35 1-2 by 28 1-2 feet, two do. each 45 by 22 feet, three recitation rooms, suit of rooms for janitor's residence, clothes rooms, corridors, &c., the latter being arranged as in the second story. The second and third stories are each 16 feet high in the clear. The first story is raised 6 feet above the level of lot, leaving a lofty basement story under which will be occupied by heating apparatus, storage and fuel rooms.

The elevation is designed in the Italian style of architecture, and can be sufficiently understood by the accompanying engraving. The quoins in the corners, the window and door caps and sills, the cornice, the architave mouldings, belt courses, &c., are finished in imitation of brown free stone,—the remainder of the work being of hand pressed brick.

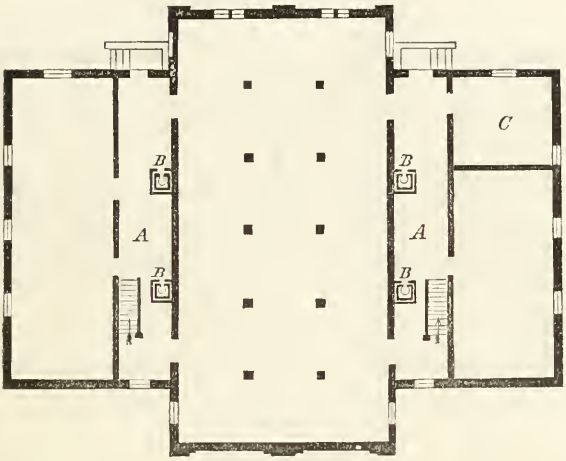
There are several advantages claimed in the plan of this Union School. In the first place the large room or chapel is placed in the first, instead of as is usual, in the third or upper story. This is infinitely more convenient and safe, than it is to require an entire congregation at commencement or other exercises, to climb up to the top of a high building. It is also more desirable, as the infant children can be taken into the room on all occasions, without danger to them, which in ordinary cases, tutors are afraid to do. In this plan it will be seen that the infant children have access to their school room by side doors, independent of the main halls which are used by the older scholars, also a very desirable arrangement. The entire separation of the sexes in the access to, and egress from, the school is secured, and yet by the interior arrangement of the rooms they can unite when required during their studies, and separate again to their respective class rooms without confusion or inconvenience. Constructively also it has several advantages. Requiring strong interior walls, there is ample opportunity for carrying up the warm air and ventilating flues in them, instead of in outside walls, thereby securing more sure and constant action of the air in the flues, both injecting and ejecting, and removing all doubt as to their proper action. The doors to all rooms are made with a swinging panel over the transom, so that in the warm weather, by opening these, and the windows of halls and rooms, a constant change of air is gained. The exterior walls are all hollow and plastered into the brick work. The staircases are wide and easy to ascend, giving ample opportunity to discharge the entire number of scholars in a few seconds of time.

The plans have been originated, matured and carried out, by Messrs. Jordan & Anderson of Detroit, Michigan.



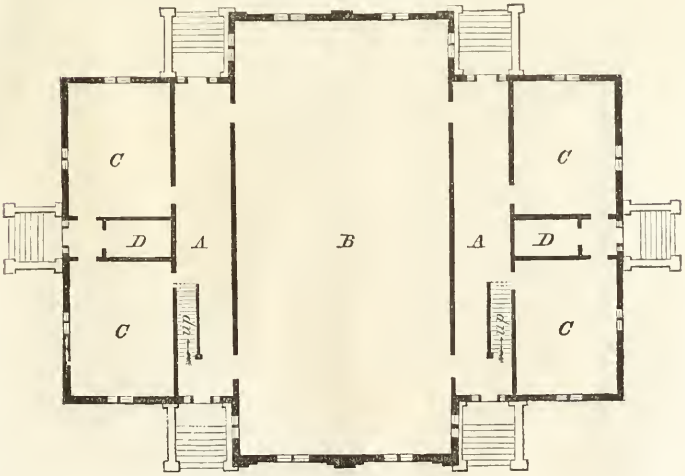
UNION PUBLIC SCHOOL. YPSILANTI, MICHIGAN.

Fig. 2.—Plan of Basement.



A A—Halls.
B B B B—Furnaces.
C—Janitor's Room.

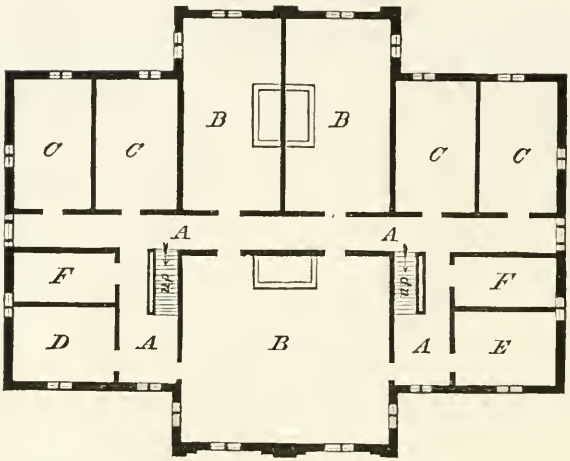
Fig. 3.—Plan of First Story.



A A—Halls.
B—Chapel, or Hall for general exercises.
C C C C—Primary Rooms.
D D—Clothes Rooms.

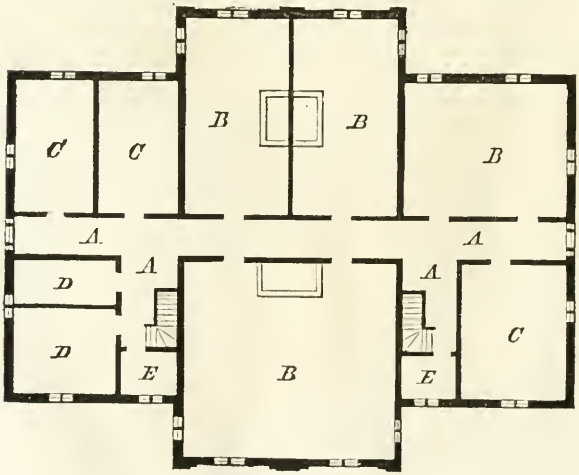
Scale 40 ft. to 1 inch.

Fig. 4.—Second Story Plan.



A A A A—Halls.
B B B—Class Rooms.
C C C—Recitation Rooms.
D—Library.
E—Apparatus Room.
F—Clothes Rooms.

Fig. 4.—Third Story Plan.



A A A A—Halls.
B B B B—Class Rooms.
C C C—Recitation Rooms.
D D—Tutors' Rooms.
E E—Clothes Rooms.

Scale 40 ft. to 1 inch.

Plans of Union School-house in Ann Arbor, Michigan.

The grounds of the Public High School or Union School in the city of Ann Arbor, Michigan, occupy an entire square—in the center of which (Figure 2) the building stands. That portion which is in front is planted with trees and shrubbery, so dispersed with intervals of green sward and parterres of flowers, by an experienced gardener, as to produce the finest effect. The portion in the rear is divided into two yards, appropriately fitted up for the recreations of either sex.

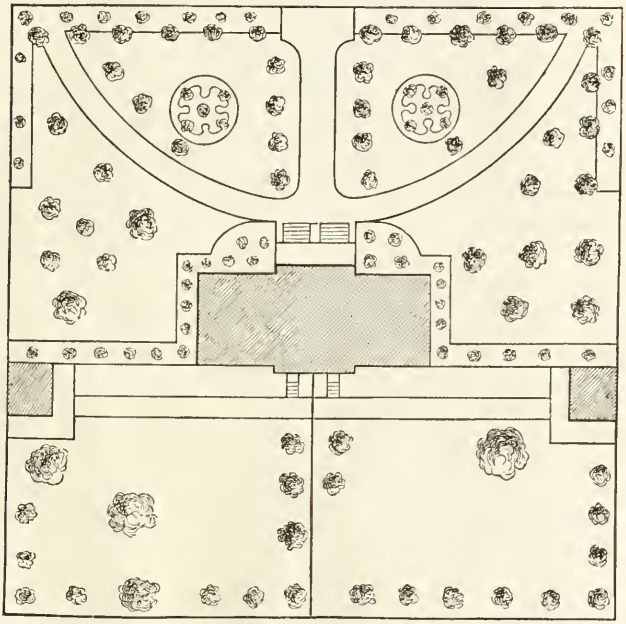
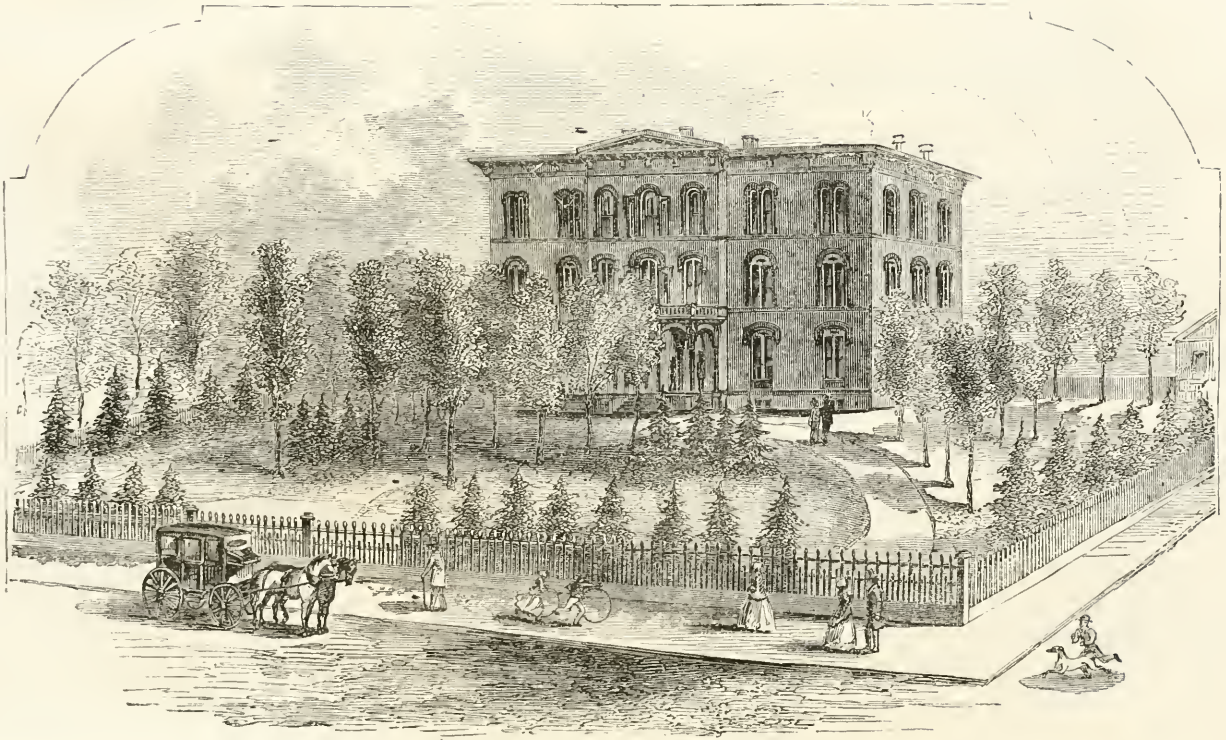


Fig. 2. Grounds.

The building is three stories high, as is shown in Figure 1, besides a basement 9 feet high. The first and second stories are each 12 feet, and the third story, which is finished in one hall, used for chapel and other general exercises of the school, is 16 feet in the clear.

The two wings on the first and second floors are occupied by class-rooms, (A.) each 36 by 37 feet—those on one side for girls and those on the other for boys—each class-room having a large recitation room (B.) On the lower floor one of these rooms is occupied by the library, and the other by apparatus. There are appropriate rooms (D. E. C.) for depositing outer garments. The furniture is of the latest and best style for strength and convenience. Ventilation is secured by separate flues, (V.) and the entire building is heated by air, warmed by furnaces in the basement, and introduced at different points (*h.*)

The grounds, the school-house, and the school constitute one of the attractions of Ann Arbor.



PUBLIC SCHOOL IN ANN ARBOR, MICHIGAN.

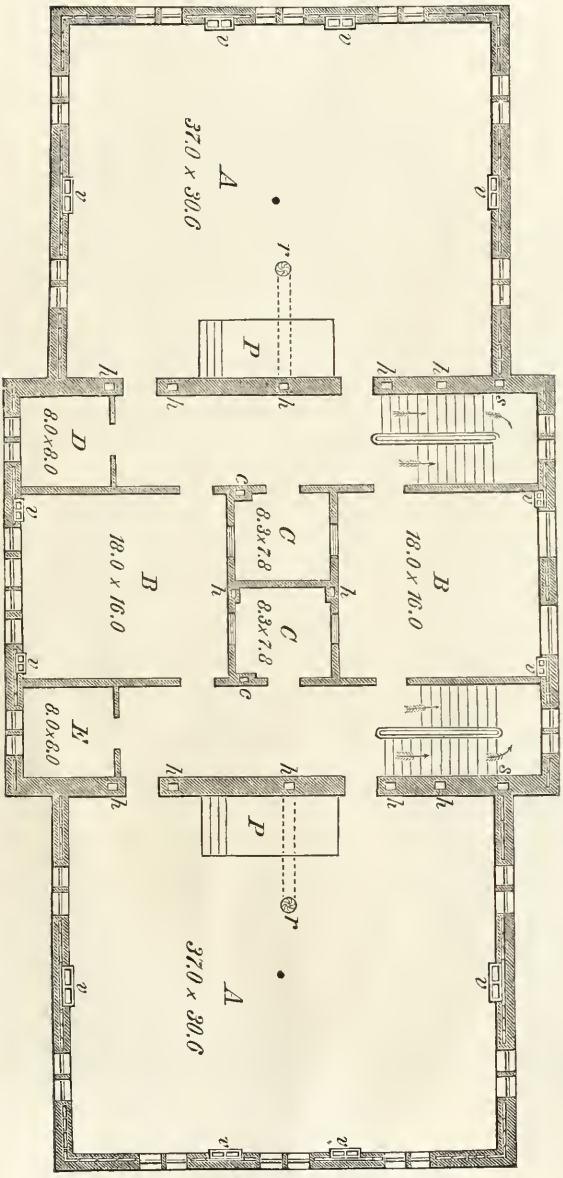
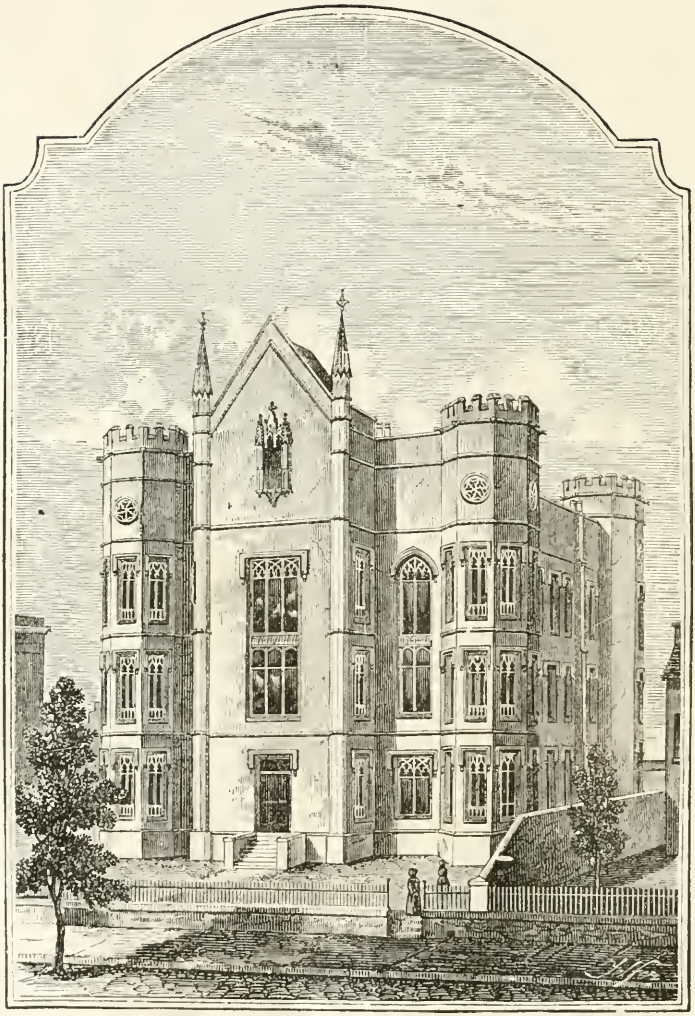


Fig. 3. First and Second Floors.



HUGHE'S CITY HIGH SCHOOL, CINCINNATI

Plans of Hughes' City High School of Cincinnati.

The Hughes City High School is one of two Public High Schools, sustained partly out of two trust estates, known as the "Woodward" and "Hughes" Funds, by the City of Cincinnati, as part of its system of public instruction. This system has grown up to its present extent and usefulness since 1828–9, when Col. Andrew Mack carried through the Legislature of Ohio, a bill for a special act, imposing a tax of $7,000 upon the city, for the erection of suitable buildings in the several wards, and an annual tax of $7,000 in each subsequent year, which, together with the State appropriation, was to be applied to the support of common schools. Under this act, the system was commenced, and in 1834, it was better grounded and greatly extended by an act authorizing the City Council to build substantial school-houses, and to provide for the support of common schools therein at the expense of the city. Accordingly, the city was divided into districts, and in the course of four years nine buildings were erected, at an expense of $96,000—which, in location, size, and arrangement, were greatly in advance of the then generally received notices of school architecture. From year to year the number of houses has been increased, to meet the demands of the growing population, and the style and fixtures greatly improved. The care of the schools is committed to a Board of Trustees and Visitors, one for each ward, elected by the legal voters thereof.

In 1845, the board were authorized to establish schools of different grades, and in 1847, a Central High School was organized under the charge of Prof. H. H. Barney, who has just (1853,) been elected State Superintendent of Common Schools.

In 1850, the Legislature authorized the appointment of a Superintendent of Common Schools, "whose duty it should be to visit and superintend all the common schools of the city, and, under the direction of the board of trustees and visitors of common schools, to establish such course of studies, rules, and regulations as may be deemed best calculated to promote the progress and well being of said schools."

In 1852, the Woodward and Hughes Funds, amounting to $300,000, and yielding an annual income of over $6,000, were united for the purpose of sustaining two High Schools, in different sections of the city—with the same requisites for admission and course of study, and open to both sexes.

For the Hughes City High School a lot on Fifth-street was purchased for $18,000, and a building, of which the following diagrams present the size, and internal accommodations, was completed in 1853, at an expense of $20,000.

The system of Public Instruction in Cincinnati, embraces:

I. District schools—one for each of the twelve districts, into which the city is divided for school purposes. Each school is classified into four sections or grades, and the pupils pass from the lowest to the next highest on examination, which is held twice a year. In 1850, there were 6,740 pupils, under 148 teachers, of whom 124 were females.

II. German English Schools—three in number, are intended for the special accommodations of children born of German parents—and who are taught both the German and English language. In 1850, there were three schools, twenty-four teachers, and twenty-three hundred pupils.

III. Evening Schools. Cincinnati was one of the first cities to provide this class of schools for children who could not attend the day schools, and for adults whose early education had been neglected. In 1850, there were six schools, open five evenings in the week from October to February, with about six hundred pupils.

IV. High Schools—of which there are now (1853) two.

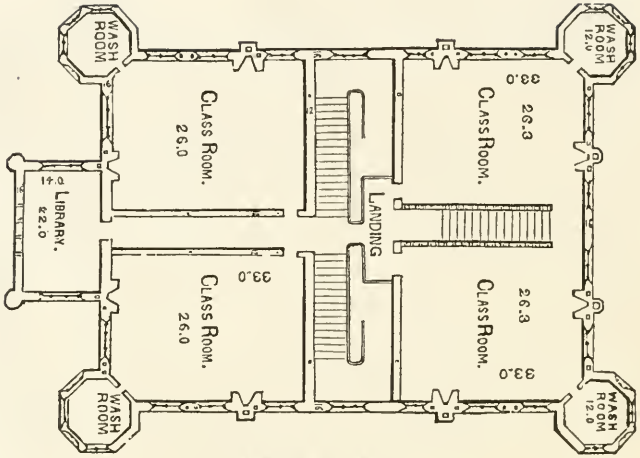


Fig. 2.—Basement

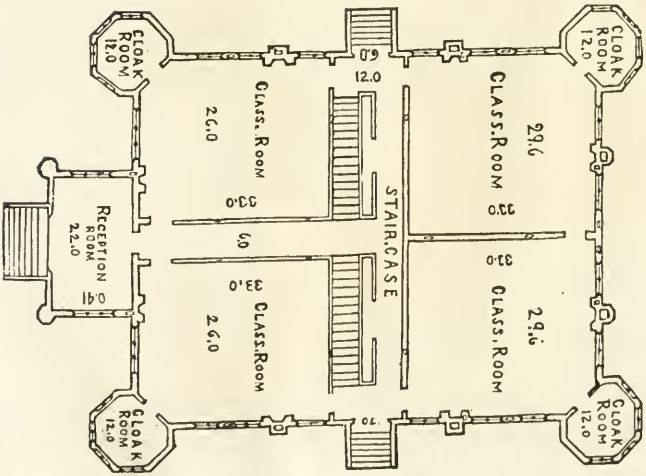


Fig. 3.—First Floor.

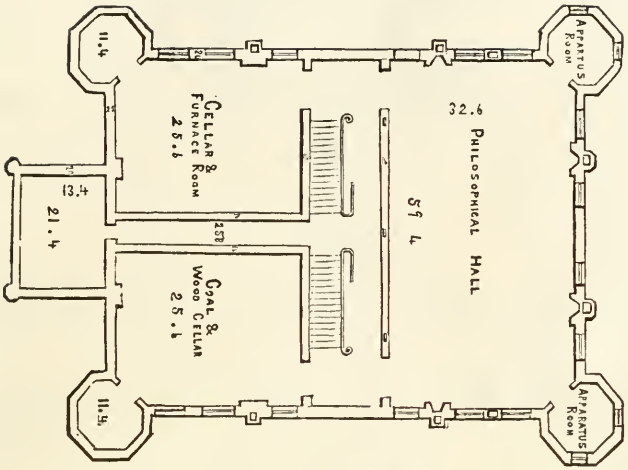


Fig. 4.—Second Floor.

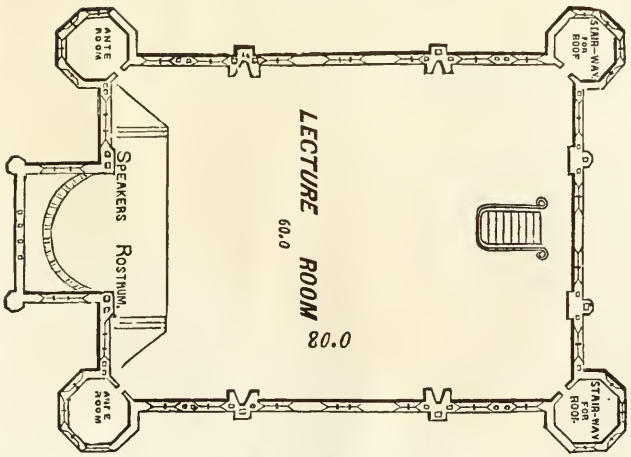
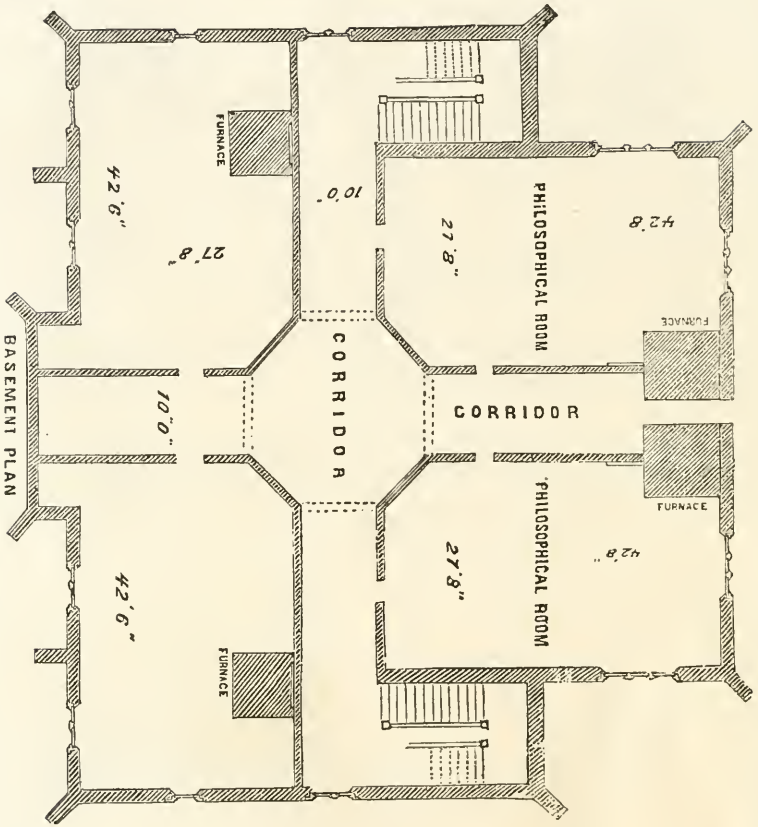


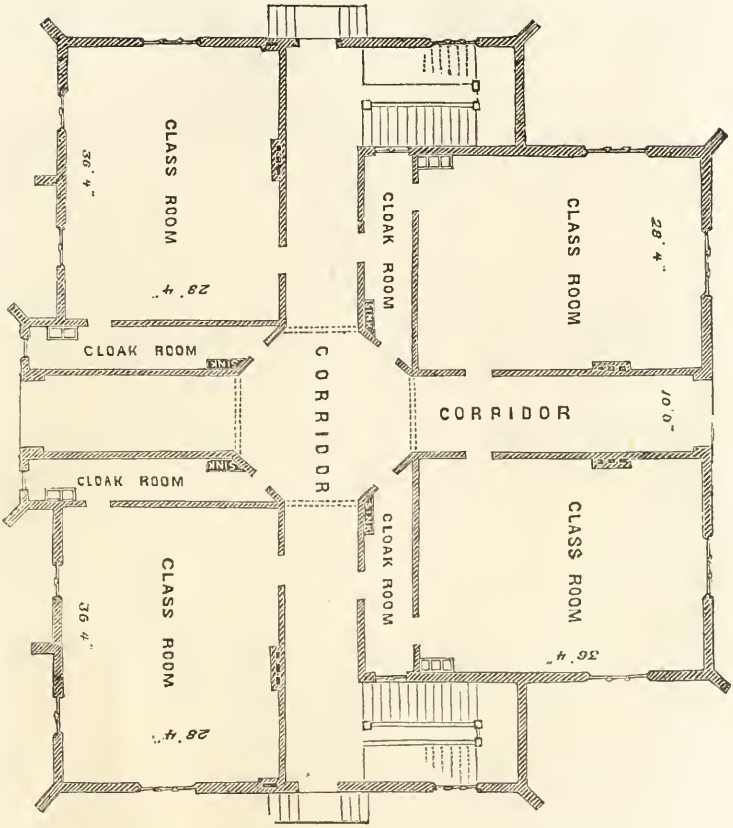
Fig. 5.—Third Floor.



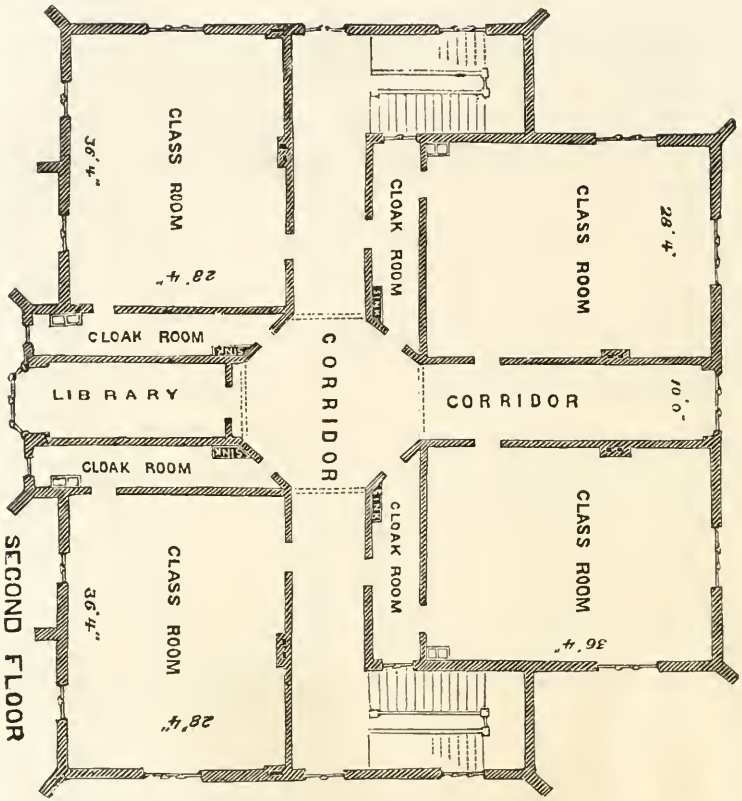
Plans of Woodward High School.

This beautiful building, in the Tudor style of architecture, is located on a lot bounded on the north by Franklin street, on the south by Woodward street, between Broadway and Sycamore streets. It is constructed of brick, with solid buttresses running the height of the building and terminating with ornamental pinacles. The windows are of rich tracery, but sufficiently massive to give an idea of strength,—and quite unlike the cobweb effect usually produced by cast iron imitations of stone. The external decorations are very rich, and possess those bold and artistic outlines so peculiar to the style. The roof is of singular but pleasing construction, steep and lofty, covered entirely with cut slates, which give a rich appearance, and fringed with ornamental ridge work. In conception, and execution, it is unquestionably the most correct architectural specimen of this class of collegiate buildings which has yet been produced in our Western States.

The basement, which is lofty and well-lighted, comprises philosophical and apparatus rooms, large and well-regulated chambers for the heating apparatus, fuel, &c.; and the approach to it is by a continuance of the grand staircases, rendering this portion of the building as accessible and well-ventilated and lighted as any other.



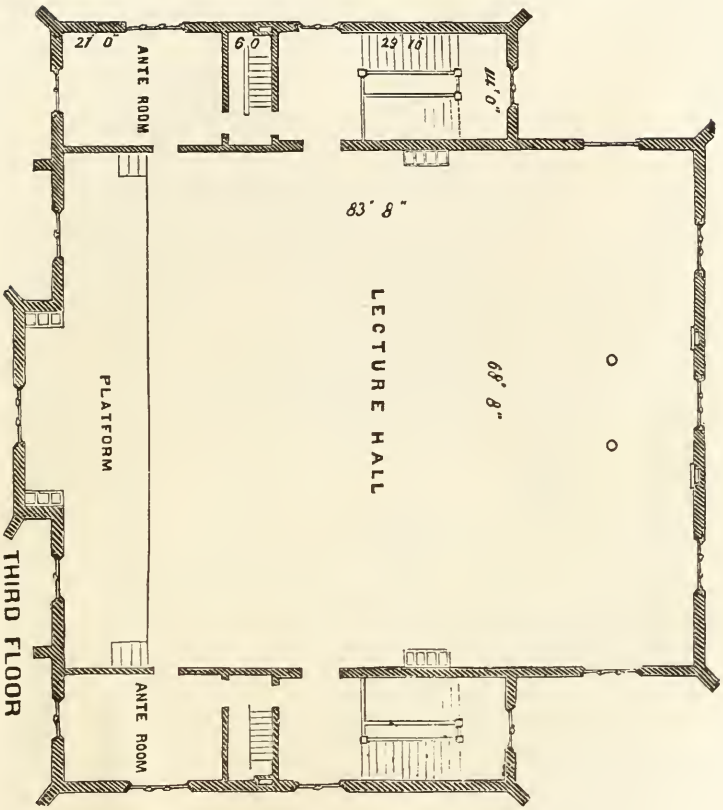
The ground floor has entrances on each of the four sides, leading to spacious corridors, which cross at right angles in the centre of the building,—the intersection being arranged in the form of an octagon, with arches on each side, producing an imposing effect. On this floor are four large class rooms, each 36 feet by 28 feet, well arranged with reference to the position of teacher, and the doors so located that the scholars face any one who enters. Contiguous to each class room is a commodious cloak room, accessible both to the corridors and class rooms. One of the most noticeable and admirably disposed features of the building is the staircases. There are two of these, forming a flank to each side of the building. They extend from the basement to the lecture hall, on third floor, and terminate in two beautiful towers, which add materially to the external effect of the building. These staircases are wide, of very easy ascent, and, in their form of construction, with the arching overhead, present a really noble appearance. But this is their least merit; located as they are, they afford an entrance on each side to the grand lecture hall, and, although contiguous to the latter, do not mar its beauty or comfort by breaking up any portion of its space. Another invaluable result from this treatment, is security in case of fire. Two large staircases so situated, widely apart from each other, and, although attached to, practically isolated from the main body of the



building, present the best safeguard, and render impossible the terrible calamities which have more than once resulted in our schools from the neglect of this precaution.

The second floor is identical in its arrangement with the first.

The third floor is exclusively devoted to the lecture hall, the staircases which flank and give access to it, and two ante-rooms, one on each side, accessible both from stairs and lecture hall. This lecture hall is, without exception, the grandest room of the kind which has yet been seen in this part of the world. Its entire dimensions are 83 feet by 68 feet, irrespective of the galleries, which are ingeniously arranged over the ante-rooms, and in the space gained between the ceiling of the ante-rooms and that of the lecture hall, the height of the latter being 25 feet. The effect of these arched galleries at the end of the room is very fine. At one end of the room is a raised platform, occupying in length the entire width of the room, and in the centre of this end of the hall is a wide and lofty arched recess. The appearance of the hall, with its windows of rich Gothic tracery, the arched galleries, the ceiling formed of oak leaves crossing each other with handsome rosettes at their intersection, and deep-sunk panels of a dark blue color, the



rich wainscotting of the walls, and handsomely devised doorways, present altogether an appearance of unusual beauty. The artistic peculiarities of the Tudor style of Gothic have been faithfully carried into the minutest features of this structure, both internally and externally; and the total absence of any admixture of other styles produces that charming effect of harmony and unity which is the prevailing characteristic of this building.

The enclosure of the area, on the Franklin street or main front, is formed of a rich iron railing, of Gothic design, resting upon a bold plinth of Dayton stone. The piers which flank the enclosure at each end, and the central gate piers, are also of Dayton stone, of beautiful design, and richly carved and ornamented.

The cost of the building was very near $44,000, including four furnaces for warming, gas fixtures, &c.

The entire cost of the structure, including fence, walls, railing, grading, &c., was $53,000. It was designed and superintended by J. R. Hamilton, architect, and erected by Daniel Lavery, contractor, under the foremanship of John Taylor,—all of Cincinnati.

Improvements in the Plans and Construction of Public School-houses in Philadelphia.

HOLLINGSWORTH SCHOOL.

LETTER FROM EDWARD SHIPPEN, ESQ., PRESIDENT OF THE BOARD OF CONTROLLERS OF PUBLIC SCHOOLS.

The large, older, and closely built cities of the United States suffer in comparison with their junior sisters in regard to their facilities for the placing of School-edifices. In the new cities there is ample opportunity of obtaining space at moderate cost, and in convenient localities—not so however with the old. School-houses should be fixed at centres of defined school-districts. In the old cities, this is impracticable, as in Philadelphia for instance, at least in the city proper. Consequently there has been built comparatively few School edifices for the public in the last ten years. At length it became essential, in order to supply the demand, that buildings of all conceivable plan, kind, and description, from the rope walk to the stable, from factory to the private residence, should be used for School purposes. The School Controllers eventually took a determined stand, and claimed at the hands of the City Councils that the children of their constituency had a right to be lodged six hours a day in healthy and convenient School-houses, that they had a right to the pure air and sunlight which Providence accords to all mankind free of cost, and that if the mind was worthy of cultivation and preservation, the body was equally so. The Controllers claimed that one million of dollars was needed for building purposes alone, and that so much more was required as would command lots for the new edifices. The claim was heeded, the million dollars accorded, and several hundred thousand dollars more expended in the purchase of lots, in most cases not large enough, but as large as could be had, save at exorbitant cost.

Thus armed and equipped, the Controllers determined that the new Schools should be erected upon the most approved modern models; that they should embrace all points of utility, and should avoid all those which had been tried and had failed. To accomplish this desirable end, their Committee closely examined the edifices of Boston, Providence, Worcester, Baltimore, Chicago, Milwaukee, St. Louis, Columbus, and other cities. In these examinations, much attention was given to details, and it may be fairly presumed that all the modern improvements and appliances have been studied, adopted, or rejected, and that the new structures will have much to commend them to those who seek information upon the subject of School Architecture.

The Report of the Philadelphia School Board of 1867 gives seventeen well executed wood-cuts of elevations and plans now in process of erection. It was wisely decided that among other points should be attentively regarded the following features:

Proper *economy*, not *parsimony*.

That while the School-house should present to the public eye a neat architectural design, all useless ornamentation, internal and external, should be avoided, and most of all that the "confectionery" as well as the millinery of architecture should be dispensed with as useless, costly, and out of taste.

That the School structures should be erected with a view to durability, and the avoidance as far as possible of repair.

That whenever the location permitted, the building should stand alone, for convenience, for light, and for ventilation.

That the best and most economical mode of heating and ventilation should be adopted.

That all buildings should have, when the size and location of lot admitted, light to each room from two exterior sides.

That staircases of easy ascent should be located in different parts of the building, and ample means of ingress and egress should be afforded, so that in case of sudden alarm a whole School might be cleared instantly of its inmates without confusion or danger.

That each class-room should have accommodation for hats and cloaks conveniently located.

That each class-room should be able to dismiss *directly* into the hall or stairways.

That the hardware for School buildings should be suitable for constant and unusual use; and that in all other particulars, regard should be had to utility, economy, convenience, and appearances.

The mode of obtaining plans in Philadelphia for buildings was changed so as to permit those who are most familiar with the wants and requirements of the Schools, to obtain them without being obliged to advertise for competition. The practical result of the old system had proven most unfortunate, for, as a rule, the ablest and most experienced architects were averse to competition, and were unwilling to spend their talent, time, labor, and money upon plans, at the risk of rejection; the effect therefore of the advertising system was to deprive the city of the services of very many architects of acknowledged ability, and to narrow down the competition to a very limited number.

The various Boards of School Directors have been consulted by the Committee on Property, in respect to the wants of their respective Schools, and, as a general rule, it is believed without exception, the plans adopted for new School-houses have met with the approbation of the Directors.

The Committee on Property gained many useful hints and suggestions with respect to School-houses, on their visits to Boston, Cambridge, Baltimore, Milwaukee, Chicago, St. Louis and Columbus; and it is believed that our edifices, when finished, will equal any in the country in their adaptation to School purposes; that they will be a credit and ornament to our city; and that they will, by reason of the care taken in the matters of warming, light, and ventilation, preserve the health of our children, many of whom have in the past been stored in factories, churches, and dwellings rented for educational purposes.

It seems to be the opinion of teachers, as well as of all who have the care and supervision of Schools in cities, that no School edifice is complete unless it contains a large hall, capable of accommodating at one time all the pupils of the School; that every room should be well lighted, and that, when practicable, direct light should come into every room from two sides, and the room should have also whatever of "borrowed light" it can command; that each School-house should be so ordered that every room may have its separate means of ingress and egress; that stairway facilities should be numerous; that each division should have its clothes-room conveniently located; and above all that ventilation, in winter and summer, should be so ordered as to keep the atmos-

phere constantly changing by the expulsion of the foul air, and the continuous introduction of pure air from without, avoiding perceptible currents.

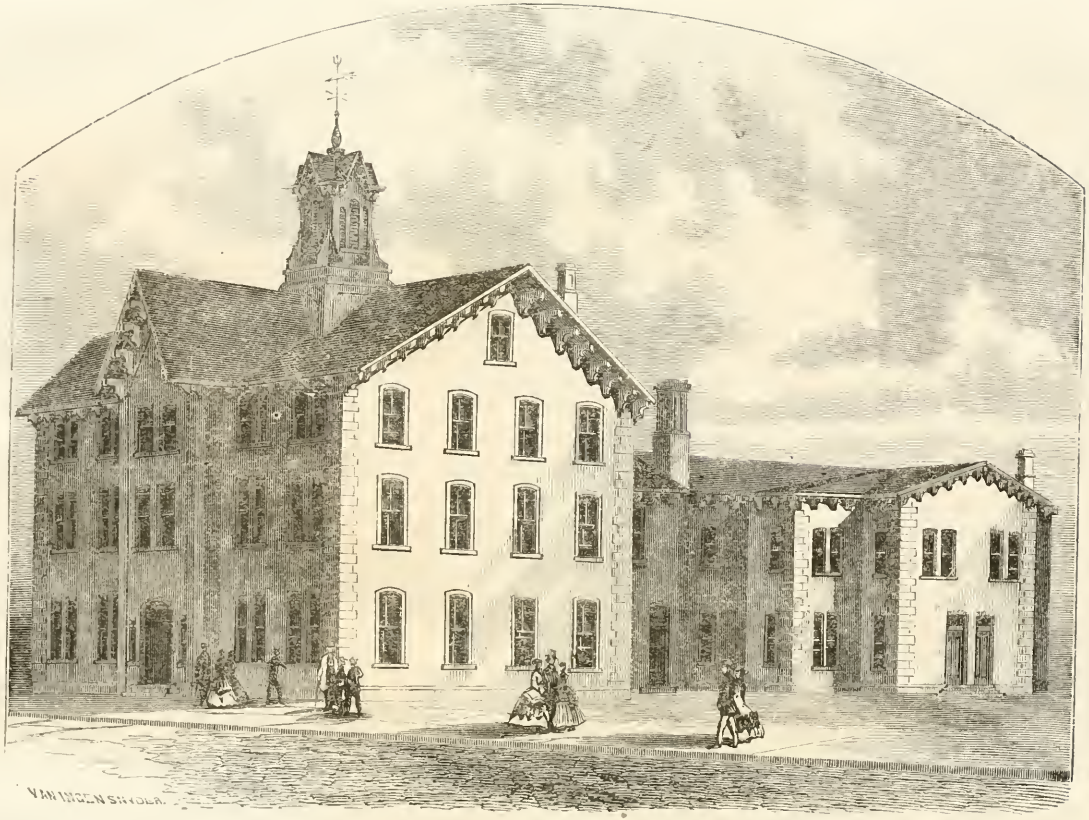
With respect to the hall accommodations above referred to, it is scarcely necessary to say that when space is expressly devoted to that purpose, and to that alone, the cost of the building is correspondingly increased.

On the contrary, if a number of class-rooms can at any time be converted into a large hall or room, the desired end is better attained.

The plans which will be found in the Report explain how this may be accomplished by means of glass partitions hung on pulleys or wheels at the top, and which with a slight impulse may be almost noiselessly rolled into the casements on the sides; one advantage of this principle over a special assembling room, besides the matter of cost, is, that any number of class-rooms in which scholars are assembled may be suddenly converted into a large room, without the vacating of seats, and without the noise or the loss of time caused by moving; and that, instantly after any general exercise, in which a whole School may join, as in singing, or in the opening or closing exercises, the partitions may be closed, the classes all being seated. Each story may be thus arranged.

When public buildings are by law given to the *lowest* bidder upon advertisement, and to be erected on the contract system upon plans and specifications, the door is open wide to fraud upon the public; as a rule, the competition is with very few, and they frequently irresponsible and unreliable builders, who seek to make pecuniary amends for low bids by slighting their work, and furnishing unsuitable material, in the hope of bringing sympathy to their aid, under various pretexts and pleas, when discovery is made or complaint uttered; and too often with success, to the public detriment. Security it is true may be demanded; this, though wise, is not enough, for the sympathy which relieves the contractor also relieves the security; nor is there any way to secure entire justice to the public on the general competitive advertising plan. In Philadelphia, the Committee upon Property of the Controllers of Public Schools have done much to guard the public interests by requiring large and reliable security, by holding the contractor fast by reservations of large, unusual, and ample powers—by requiring incessant watchfulness of the supervising architects—by the appointment of an Inspector of School buildings, whose duty it is to be on constant visitation, watching the progress of each building, and reporting weekly to the Committee. Besides these checks and guards, the Committee itself pay frequent visits.

While due regard seems to be paid to public interests, the Committee in like manner seems to look to fair dealing between the contractor and material man and his sub-contractors. By law, Public buildings are not the subjects of mechanics' lien, and ordinarily it would be possible for an irresponsible contractor to bid low, complete his contract, pocket the price, and by leaving material and labor unpaid for, make large gains himself, and throw the poor laborer and mechanic upon the mercy of a merciless man. To remedy this evil as far as practicable, the Committee has provided for a release of claim by the material man and mechanic before final payment is made; and it has proven by actual experience of great advantage to public and private interests. The form of the building contract is hereto annexed, and is commended to those who have the responsibility of erecting public buildings cast upon them.



HOLLINGSWORTH SCHOOL. Locust Street, west of Broad, Philadelphia.

HOLLINGSWORTH SCHOOL.*

Upon looking over the plans of the many new School buildings in Philadelphia, now in process of erection, one will be impressed at a glance with the Hollingsworth School, in the eighth ward. Having visited this School, the visitor will be struck at once with the completeness and adaptability of the edifice for its purposes, and upon close inspection, he will be satisfied that it is a model in all its detail, well worthy of imitation. This School should be visited in order that its simplicity, its economy and utility may be thoroughly comprehended. It seems to combine all the principles to which reference has been made. I now proceed to give a close description of all its parts, and to comment upon all points which strike us as specially worthy of note.

The Hollingsworth School is named after Thomas G. Hollingsworth, who was connected with the Public Schools of Philadelphia from their institution till his death in advanced years—a fitting tribute to one who was a faithful public servant, and who did his whole duty in his generation.

The cellars are well closed in, and the ceiling joists lathed and plastered. Frequently this important feature in public buildings and private dwellings is disregarded, and consequently the first story is cold in winter, unless heated at an unnecessary expense. A cold floor, though of boards, is not unlike one of stone in winter. Measured coal bins are built in the cellar, by which it can be fairly ascertained whether the coal is correct in quantity. A portion of the front pavement is excavated to enable the deposit of coal directly from the carts. In the cellars are located the steam furnaces, the ventilating stove for summer use, and the various radiating surfaces to generate warm air *directly under* the rooms designed to be heated.

Inside walls throughout the building are of brick; the face work of rubble, neatly jointed and pointed with Portland cement. It is common to use various coloring matters with the cement to mark the contrast between the stone and pointing more decidedly. Whatever effect this may produce to the eye, it is unwise, as all coloring material destroys the adhesivness and cohesiveness, and in time falls out, crumbles, and opens the joints to absorption of moisture. The cement however, uncolored, becomes as hard as the rocks it binds together, and is an enduring protection. The stone used as facing is laid as it comes from the quarries, the flat side outward, and requires no dressing, except when used as quoins and corners. It is readily laid, and, when judgment is used, binds well; and in walls thus built, the spalls are serviceable to fill interstices, so that no portion of the stone is lost. Rubble work as used in this School has proven to be about twenty-five per cent. cheaper than a pressed brick front, and certainly is warmer in winter and cooler in summer.

The areas to cellar windows are paved with brick, and capped with heavy North River flagging, covered with heavy iron bars as gratings. This latter is essential to guard against accidents to small children, who seem to seek dangerous places.

The window and door sills are all of granite or brown stone, and windows

* This building is planned largely upon the points and suggestions of Edward Shippen, Esq., President of the Board, after much observation by him of School edifices, and much practical attention for many years to public School-houses, by John C. Sidney, Esq., of Philadelphia, an architect who has given much study to the subject of School Architecture.

and door heads of Leiperville stone, affording a better protection to walls in case of fire than if made of wood.

The iron columns hereafter referred to rest on square stones twelve inches by twelve inches, and four thick, set upon eighteen inch walls.

Wells are emptied into sewer through twelve inch terra cotta pipes, into which all yard and roof water passes for purpose of cleansing.

The importance of height of ceiling can not be over-estimated. Fourteen feet in the clear is not too much, and though the number of steps to each story is increased as the height of ceiling is increased, yet by a judicious arrangement of two flights and platform to each story, that objection ceases to have weight. For children's use the risers should never be more than six and a-half inches, and tread twelve inches, one and one-fourth inches thick nosed.

To prevent the danger to small children from sliding on the stair-rail, a simple preventative is used in this building. A neatly devised screw with conical head projecting about half an inch above the rail, set in at distances of three feet apart, very soon admonish the sliding boys that the pastime is more comfortable in the omission than in the observance of the same.

This building is admirably arranged in the matter of stairways, all judiciously located and capable for any emergency, and most convenient for class-rooms—six in number and all well lighted.

Each class-room is furnished with convenient clothes-rooms, fitted with double hooks. An observer will ordinarily find about one-half of the clothes-hooks broken from ill usage, and therefore it is most essential that they be constructed so as to bear the rough usage of children; so in fact should all the hardware in the School-house be. In this building, the hardware has been selected with special reference to utility and school-boy usage.

The closets are open at the top for drying and ventilating purposes, and the doors of the same for the same reason are kept three inches above the floor.

The casing of window jambs is an unnecessary expense, provided the same are rough floated as is hereafter specified. In fact, the less moulding and woodwork in a School-house, the better. The washboards and architraves should be as simple as possible; mouldings only give receptacles for dust, are of no practical use, and beadings are generally for the same reason unwise, and besides are difficult to keep clean. In doors, however, modest moulding is perhaps desirable for appearance sake. Architraves and washboards look well if simply planed and beveled on both edges; they are easily painted, dusted or scrubbed, and are by no means unseemly.

Wainscoting in class-rooms may well be avoided by the rough plastering referred to. With care on the part of the architect in preparing specifications, a very large amount of material in woodwork and labor may be avoided.

In preparing doors, it should be borne in mind that they are destined for hard usage; and that therefore they should be well made and thick; inside doors not less than two inches. A parlor door may be opened a dozen times a day—a school-room door slammed by each of fifty children ten times a day. The hardware for doors should be well selected, especially where mortice locks are used. Porcelain knobs should never be used, but doors should latch with the old-fashioned substantial thumb latch. The lock need have no knob therefore. A well made fine tumbler dead-lock, with escutcheon, is all that is needed where a thumb latch is used. And we may observe that no School needs more

PLAN OF FIRST FLOOR.

HOLLINGSWORTH SCHOOL, 8TH SECTION, LOCUST ST., ABOVE BROAD.

than one lock for an outside door. This should be on the front and most exposed door, and it alone should have a knob. Other outer doors are better double bolted inside. The mortice lock and latch will not stand School use.

Inside roller blinds without boxes are preferable to outside, being more convenient and less exposed to the weather. Each fold should be cut in the centre except the one next to the frame, and be furnished with bronze or japanned fastenings, and so should be all fastenings and iron trimmings in the building, to be free from rust. Gilt and brass should be avoided.

Wainscoting is only needed where there is incessant passing, as in halls and stairways, provided the walls have the third coat of plaster of sharp pure sand washed clear and floated down hard. And in fact so should all the plastering be done throughout the building, save the ceilings; the effect is pretty, the walls will not change color nor receive pencil marks, and may be readily whitewashed or painted if at any time needed.

All outside walls should be stripped to prevent dampness before the plaster lath is put on.

Yard hydrant should be fitted with screw nozzles for hose attachment.

All glass should be well *bedded* and back-puttied; with bedding, all rattling of glass is avoided.

Before proceeding to a detailed statement of the points which present themselves, it is well to present several general features, which appear to be most striking and worthy of special comment.

1. The distribution of space and excellent arrangement of halls and entrances.
2. The lighting of the building.
3. The ventilating and heating.

It has been wisely concluded to avoid a fourth story building, and though a third story is added to the front, yet the rear has but two; so that the two first stories, containing eighteen rooms, will accommodate nine hundred children, and the third story front two hundred more—eleven hundred in all; and this is as many children as should be thrown together in one building.

There are nine class-rooms on each floor, so arranged that each has direct light from two sides, while they have also borrowed light from other sides through glass sash. This most desirable end can be obtained in the ordinary square buildings only in corner rooms—say in four rooms—while in the School in question, there is no one of the eighteen rooms without it.

A glance at the plan will at once explain how by means of adding corners or projections, windows can be furnished for each room on two sides, no matter how many rooms in one story. Besides being a service in the matter of light, the plan also aids in the *natural system* of ventilation.

The halls are cornered so as to form the letter T; at the bottom of the T is the main entrance, and at the other ends, the side entrances, and as arranged in the Hollingsworth School, there can be a direct circulation of air from North to South, and from East to West, most serviceable in Summer.

The sliding sash before referred to are hung upon iron rails, securely fastened to the girders. Upon these rails the sash doors, fitted with pulleys, are easily glided into their respective casements, and are guided at the bottom by bolts which run along the floor grooves cut transversely over the flooring; they roll almost noiselessly. The whole arrangement is very simple, and durable.

The heating by steam and the ventilation are under one contract. It

2nd. Floor.
A
A
A
A
A
A
A
A
HALL
17 X 44
c
c
c
c
c
c
c
c
c
A. Class Rooms, Each 24x26 feet.
c. Clothes Closets for each Class Room.

requires every part of the building to be heated to 70° Fahrenheit, at the same time in the coldest weather, and also that the whole atmosphere of the building should be exhausted in twenty minutes, and renewed as often with the outer air, which in winter is to be warmed and thrown into the building. The following is a description of the means and appliances to secure these ends:—

The entire heating apparatus (except a few direct radiators in the halls) is placed in the basement or cellar. The boilers are subdivided, and form two distinct heaters, placed front and back, incased with brickwork, forming heat chambers, and external air introduced; the heat from the boiler surface is utilized, so that in mild weather the building can be tempered without any perceptible pressure of steam.

The steam is conducted to groups of radiators placed in chambers under the flues leading to the different rooms, so arranged that all rooms are warmed by distinct heat chambers, and pure fresh air from outside the building conducted through air ducts under them; creating a constant influx of pure external air heated by contact with the radiators; maintaining a temperature of seventy degrees in winter, and entering in a natural condition at other times.

The ventilation is natural, by what is known as the downward principle, produced by means of a double stack four feet in diameter, with an inner flue of cast-iron, heated by the smoke and escape heat from the boilers when in operation, and by a large cannon stove at other times; thus forming a vacuum and strong upward column.

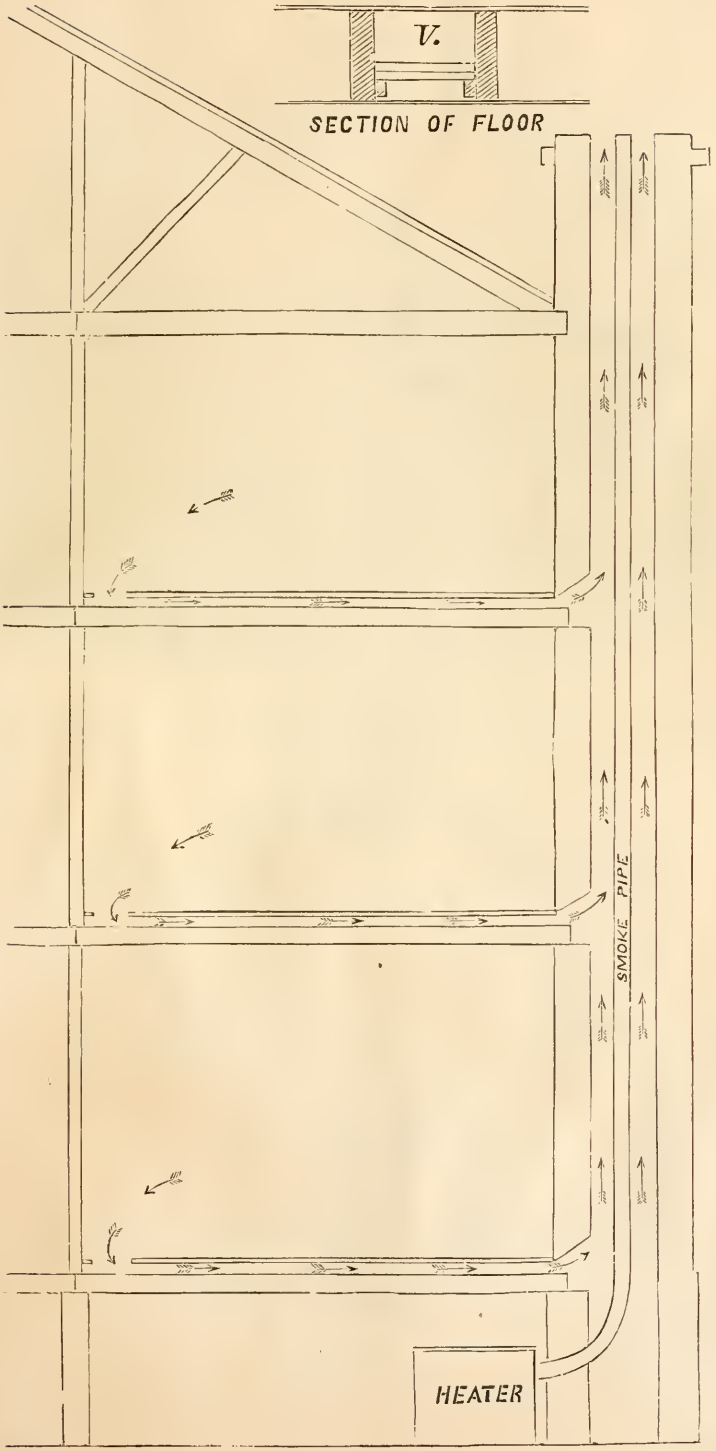
In the stack, at each floor, openings are left connected with air spaces between the ceilings and floors, forming a clear air space under the entire surface of the floors. Openings covered with iron gratings are placed in the floors through which the cool and impure air from the lower part of the rooms escapes to the heated stack, and induces the warm air to come down to the floor, passes under the children's feet, equalizes the temperature throughout the entire building, and changes it every half hour. Top ventilation is also secured by the same means when necessary to waste the heat.

I must not close without reference to an appliance for filtering the water which is to be used by the children; and I am gratified to note that among all the appliances for health, the subject of pure water is not forgotten. The filters are buried eight feet under ground, and are thus described, viz.:

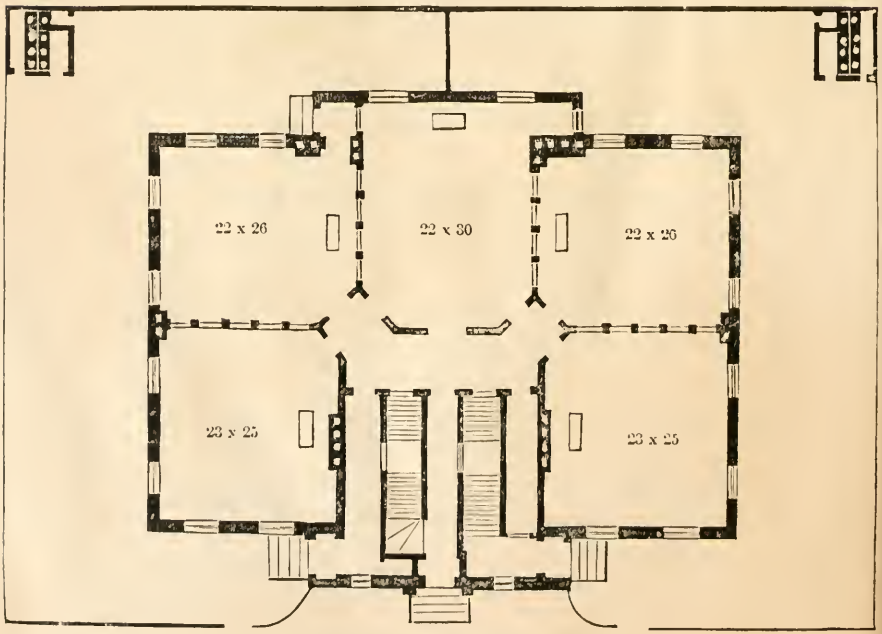
It is made of glass cut into equal lengths, about three-fourths of an inch in width, and one-eighth of an inch in thickness. These pieces are placed together, so as to form a circle fixed upon a basin composed of metal, which is the receptacle for the material filtered from the water. The glass is so arranged as to be almost water-tight, and it is only the pressure of a head that forces the water through. The water is filtered into a reservoir composed of stone jars or iron tanks, as may be preferred, the stop-cock being made so that no pressure is upon the reservoirs except when the hydrant is in use. The filtered water is drawn from the reservoirs, and the hydrant is so constructed that by moving the nozzle to one side, you draw the filtered water, and by reversing it, the ordinary water is drawn, which at the same time cleanses the filter of the accumulation of sediment, it being a self-cleansing apparatus.

EDW. SHIPPEN.

PHILADELPHIA, Dec. 12, 1867.

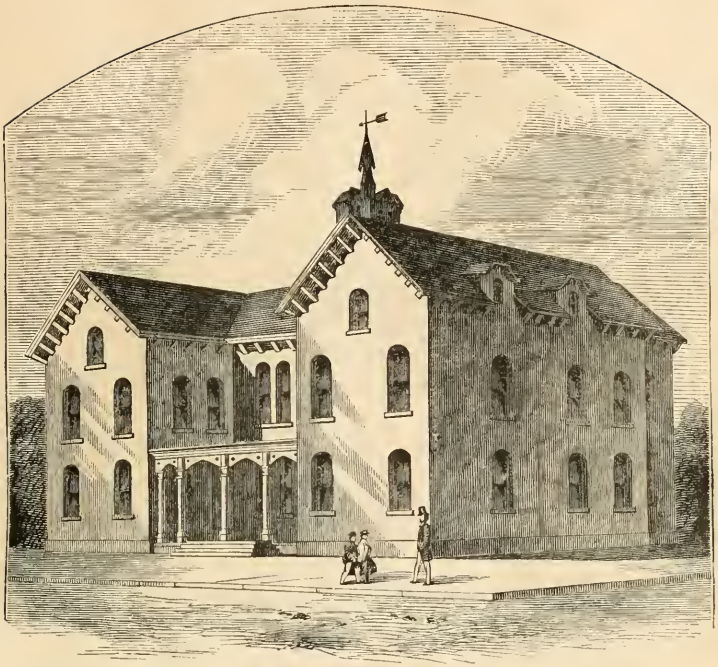

V.
SECTION OF FLOOR
SMOKE PIPE
HEATER

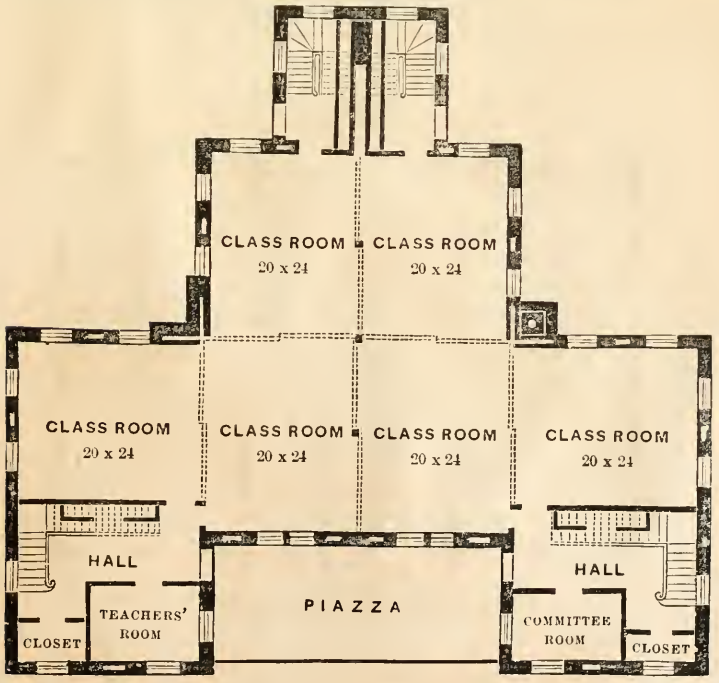
NINTH AND TASKER STREETS.



PLAN OF FIRST FLOOR.
TASKER SCHOOL, 2D SECTION.

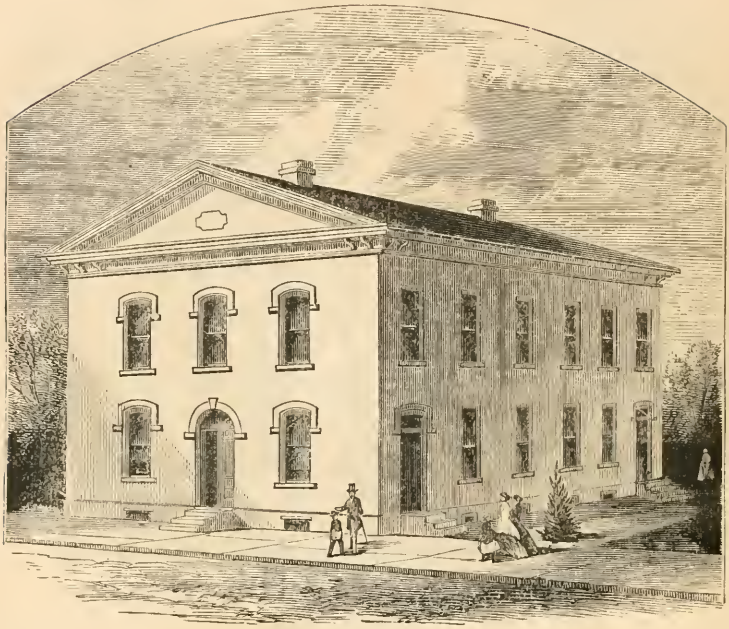
LUDLOW STREET, BELOW THIRTY-SIXTH.

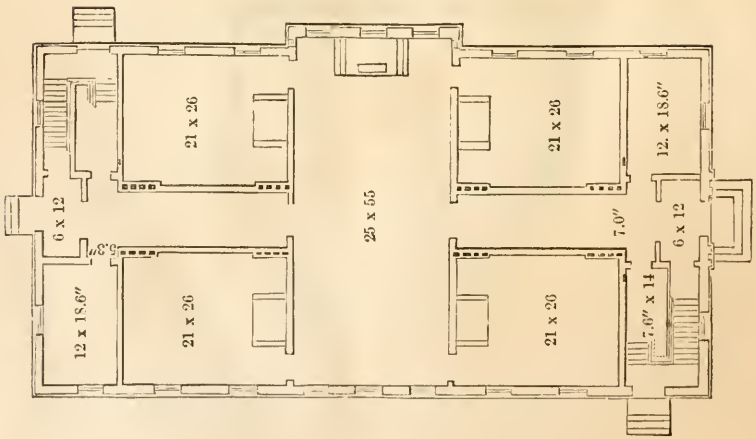




PLAN OF FIRST FLOOR.

MORRIS CITY, ABOVE FAIRMOUNT.

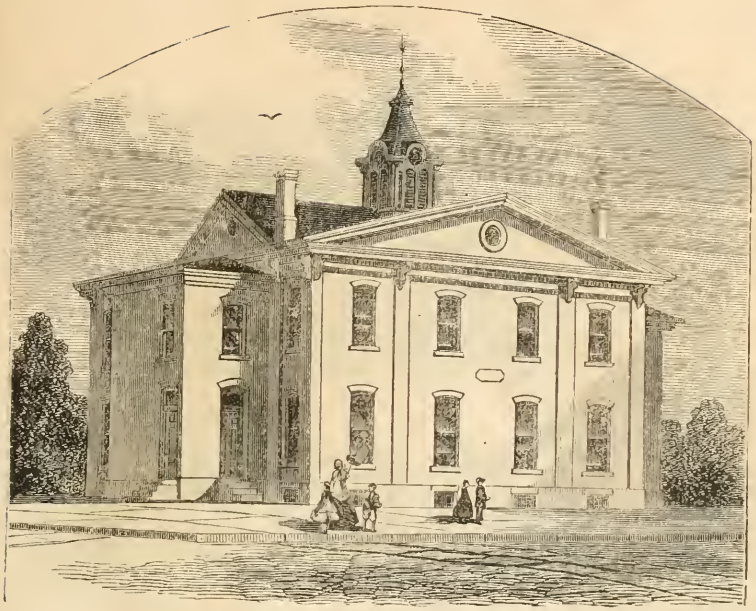


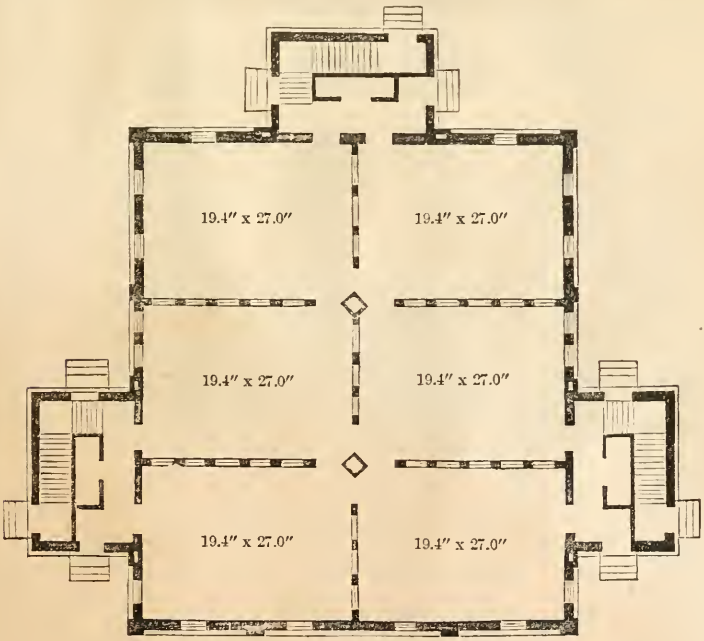


PLAN OF MORRIS SCHOOL HOUSE.

20th SECTION. ABOVE FAIRMOUNT.

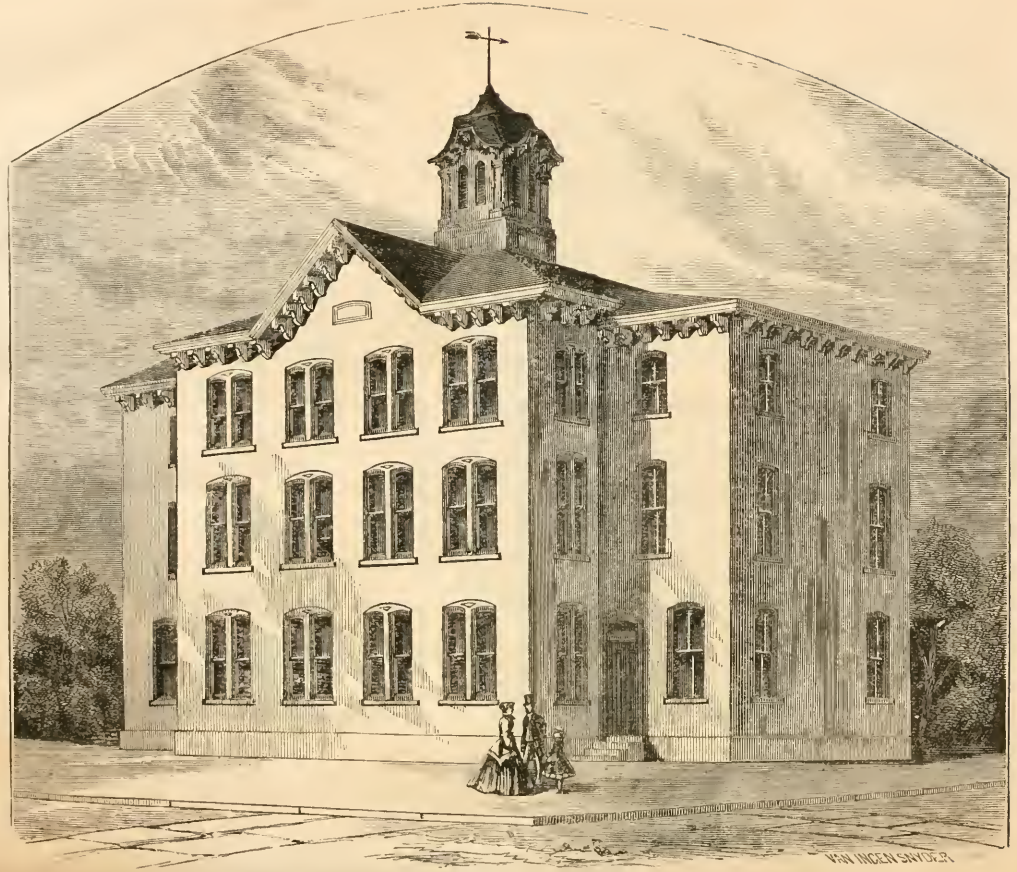
HESTONVILLE.





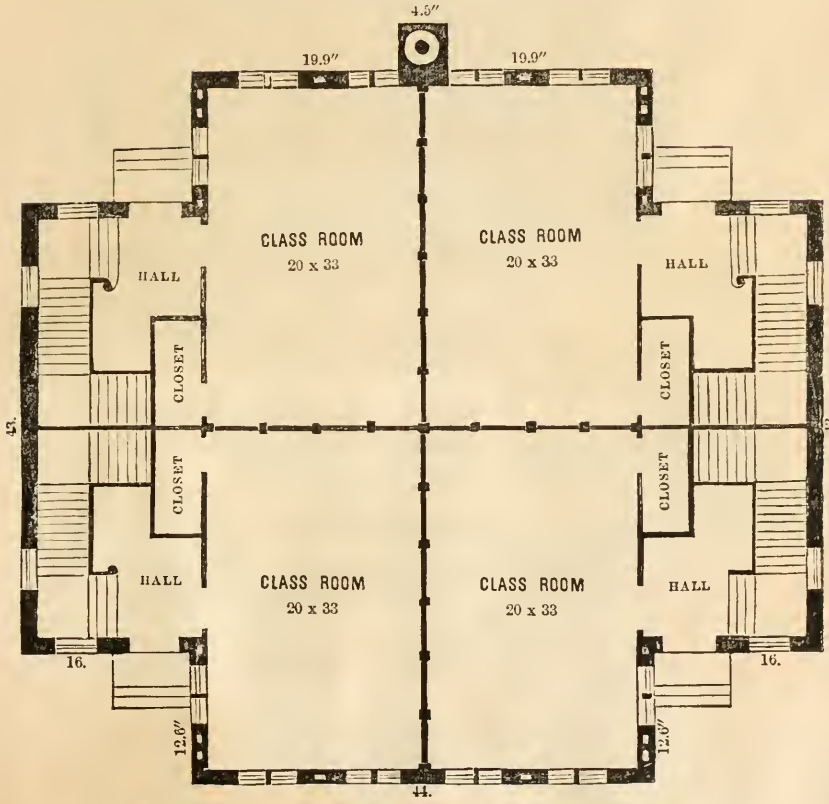
PLAN OF FIRST FLOOR.

24th SECTION.



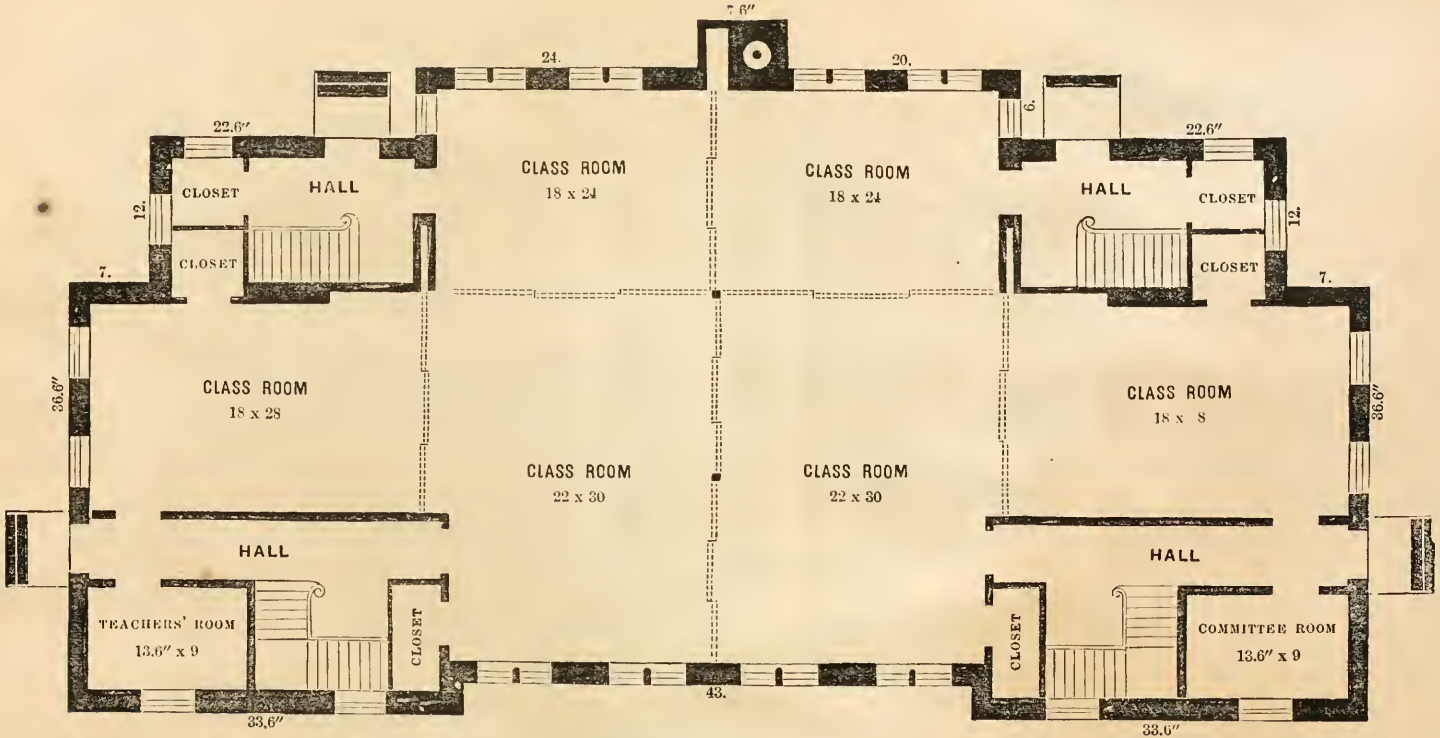
FOURTH SECTION. Twelfth Street, above Fitzwater, Philadelphia.

TWELFTH STREET, ABOVE FITZWATER.



PLAN OF FIRST FLOOR.
4TH SECTION. TWELFTH ST., ABOVE FITZWATER.

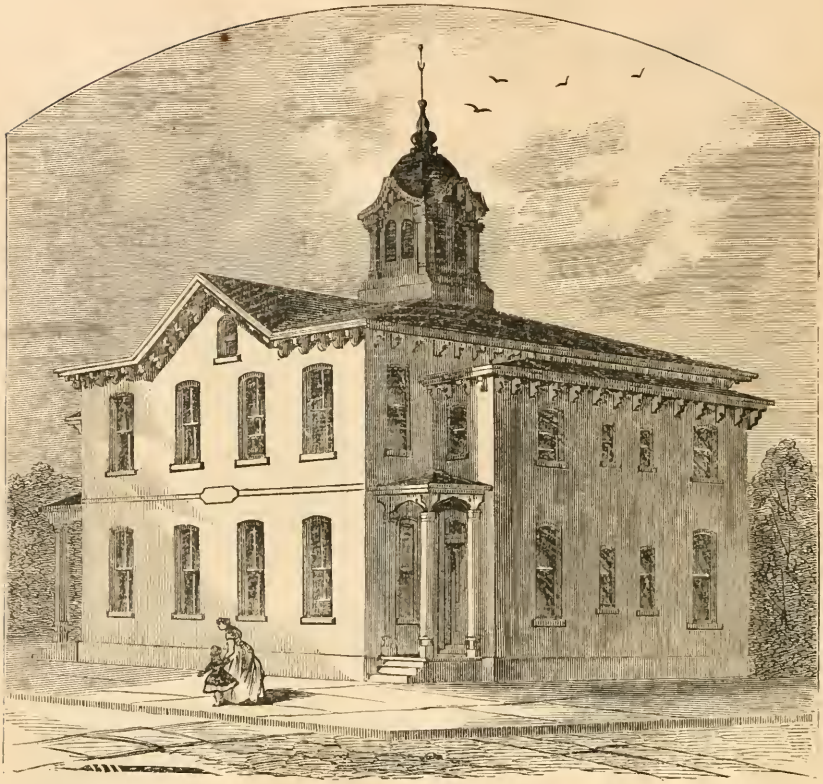
FOURTEENTH SECTION. Melon Street, below Twelfth, Philadelphia.

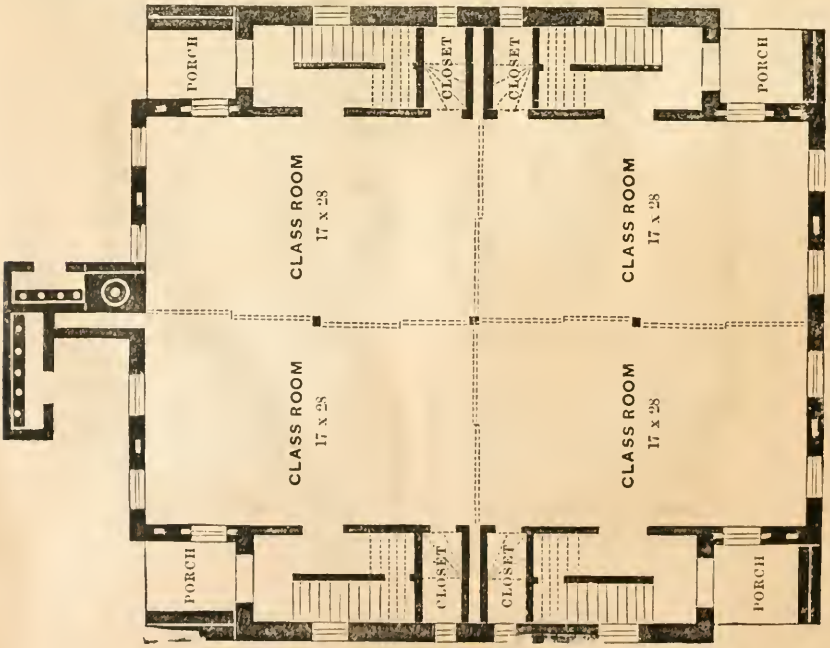


PLAN OF FIRST FLOOR

14TH SECTION, MELON ST., BELOW TWELFTH.

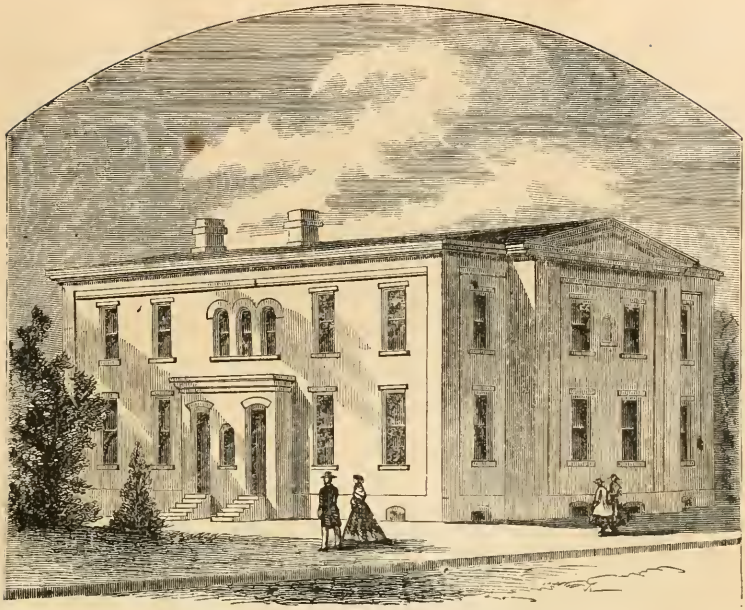
MARIA STREET, BELOW FIFTH.

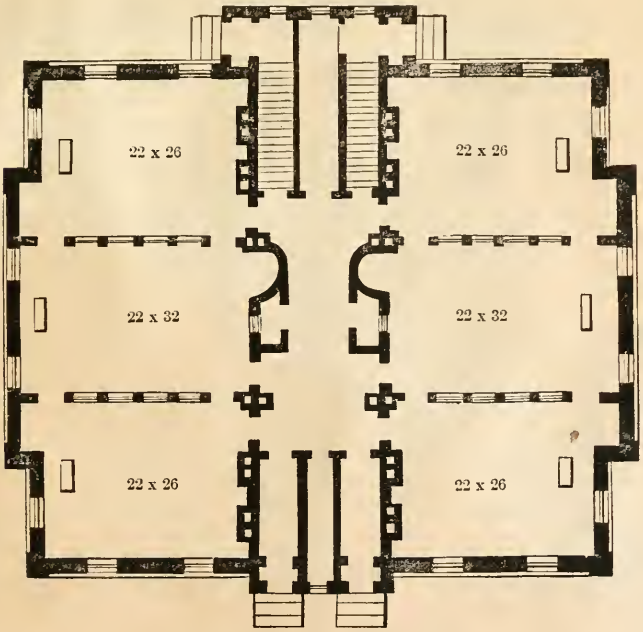




PLAN OF FIRST FLOOR.

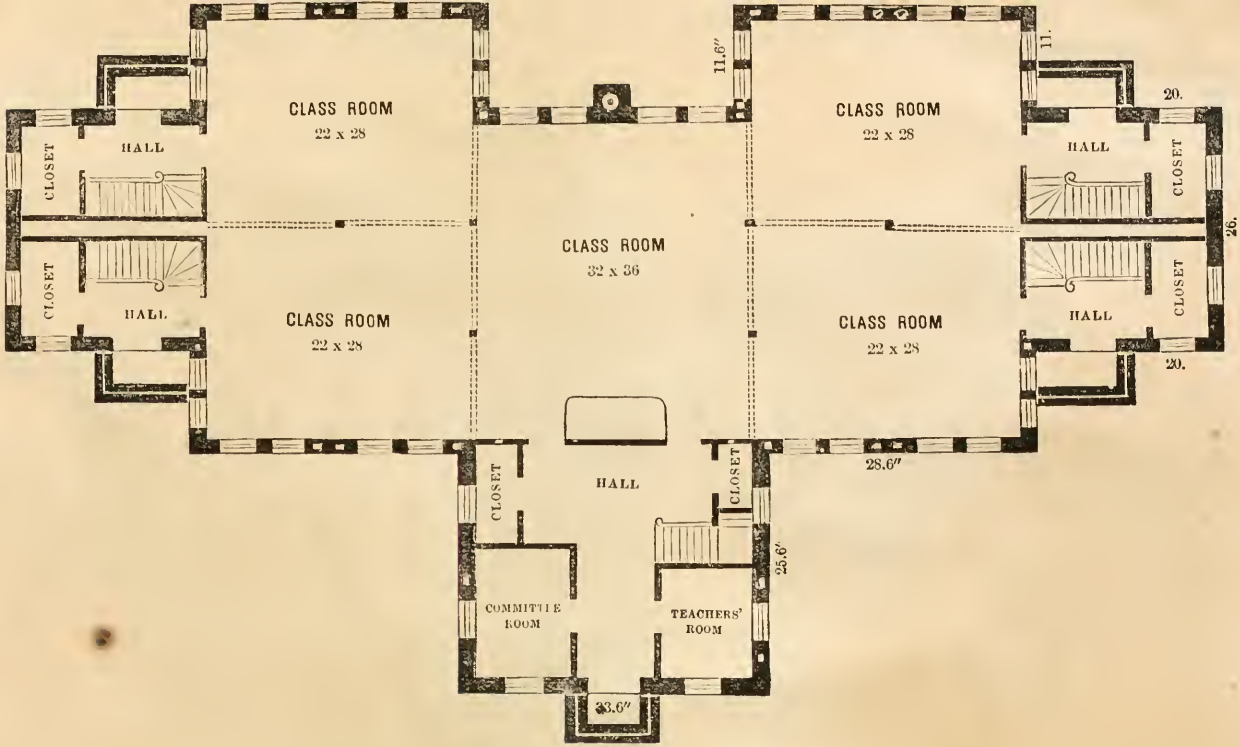
SEVENTH AND NORRIS STREETS.





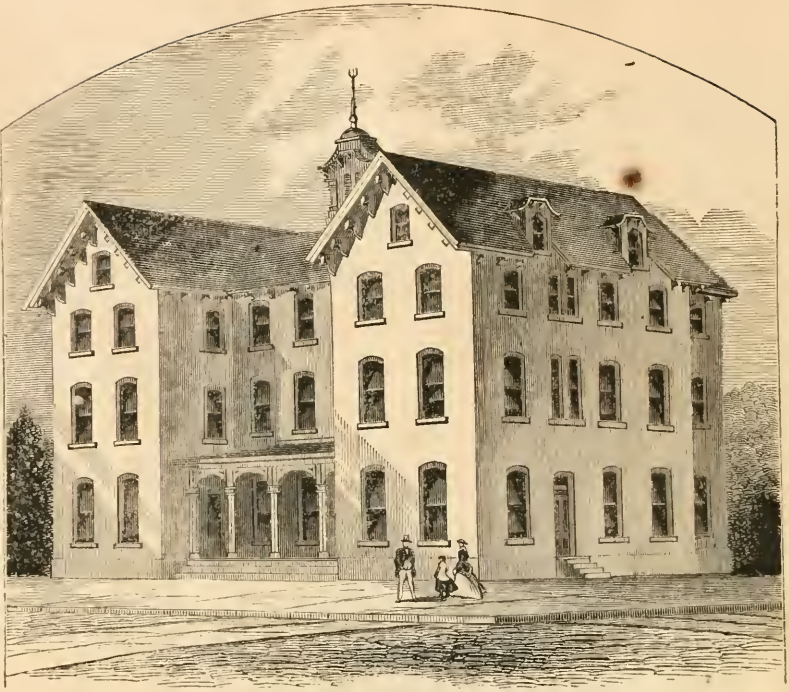
PLAN OF FIRST FLOOR.
RUTLEDGE SCHOOL. 20TH SECTION.

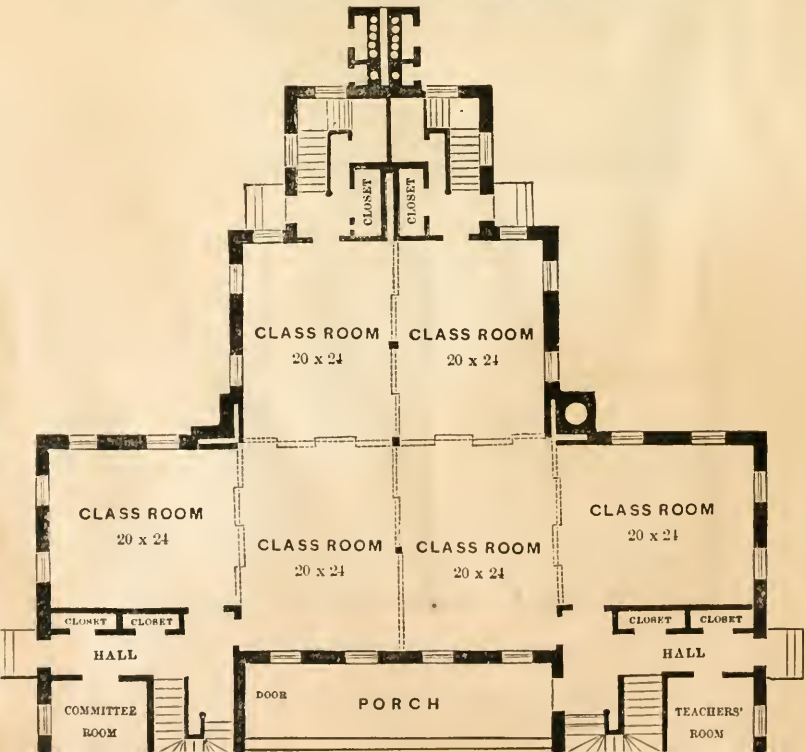
WYOMING AND VENANGO STREETS, PHILADELPHIA.



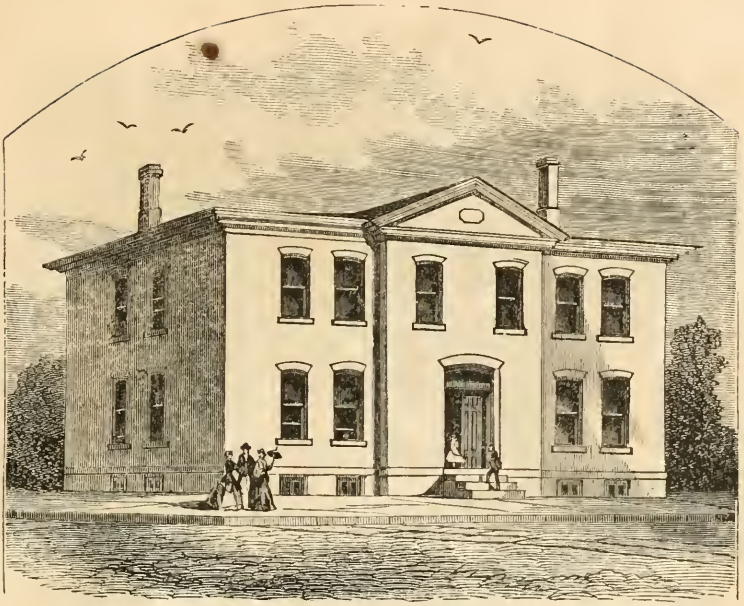
PLAN OF FIRST FLOOR.
24TH SECTION

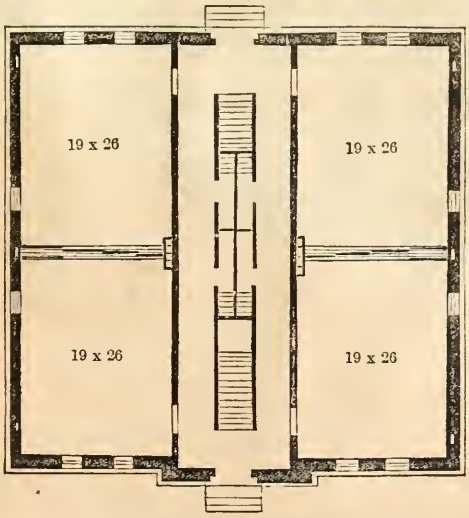
TWENTY-SECOND AND BROWN STREETS.





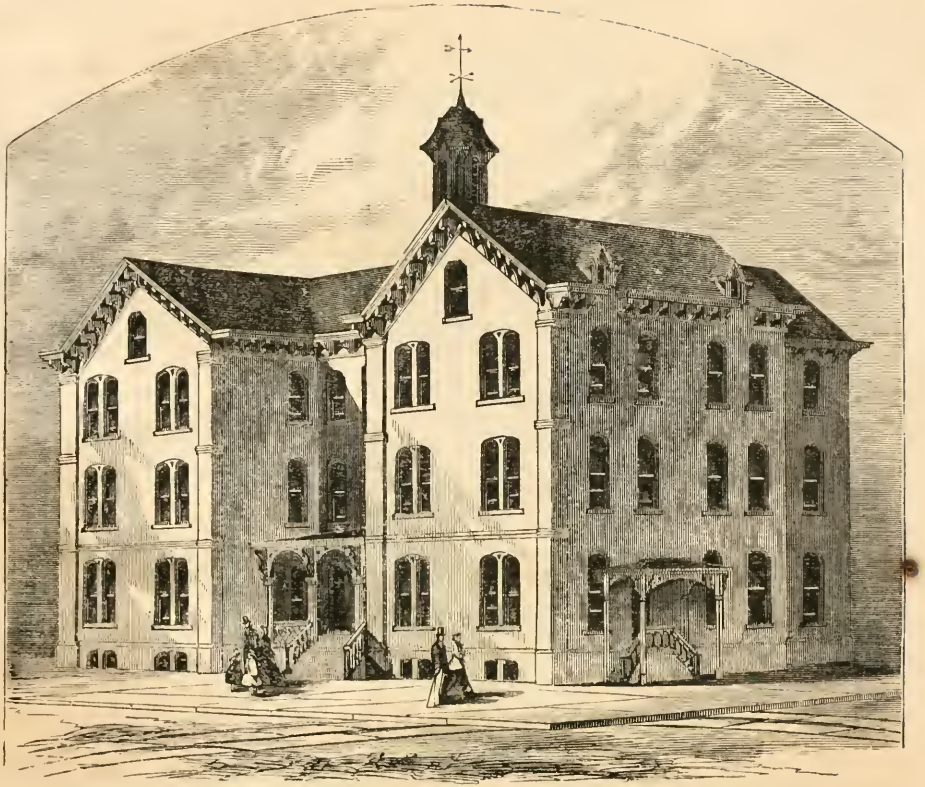
FALLS OF SCHUYLKILL.



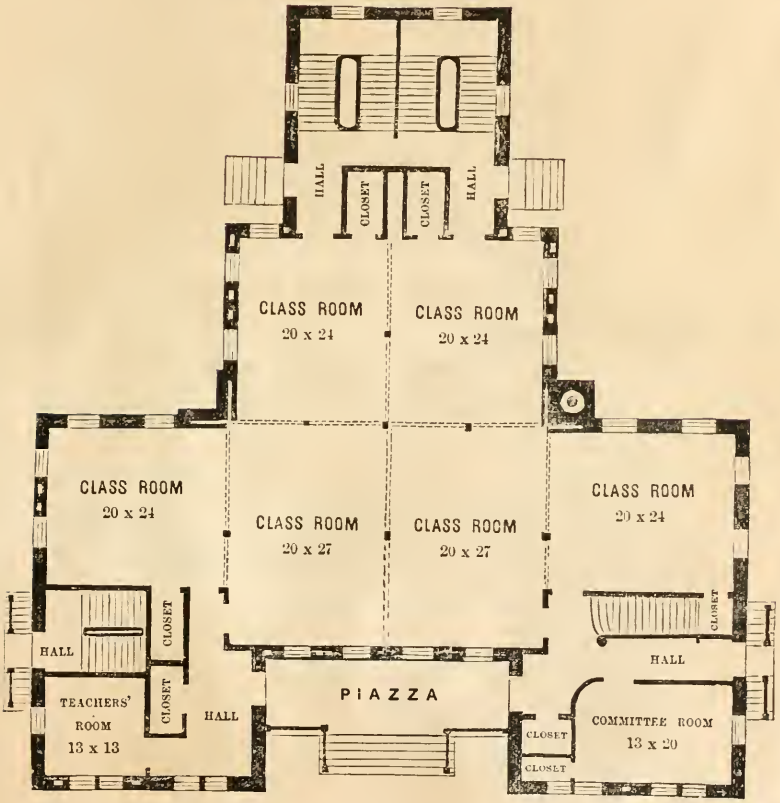


PLAN OF FOREST SCHOOL HOUSE.

21st SECTION. FALLS OF SCHUYLKILL



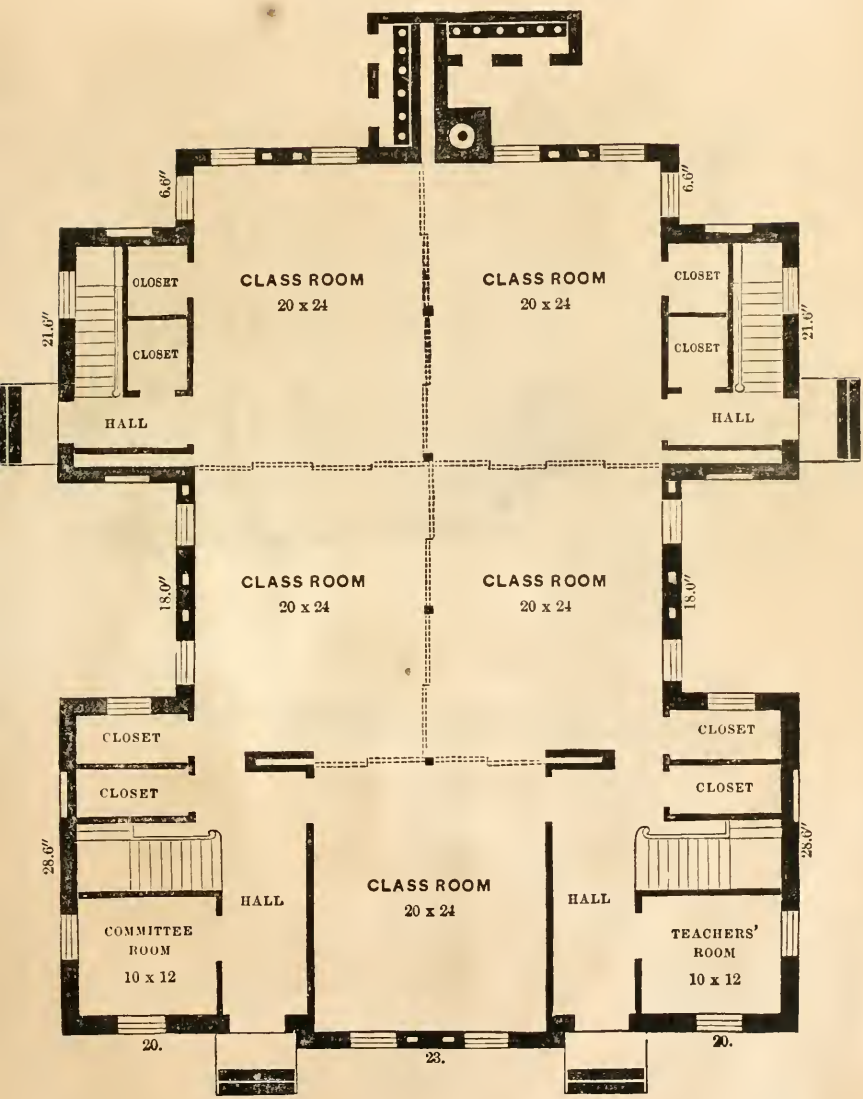
KEYSTONE GRAMMAR SCHOOLS. Nineteenth Street, above Chestnut, Philadelphia.



PLAN OF FIRST FLOOR.

9th SECTION. NINETEENTH AND BARKER STS.

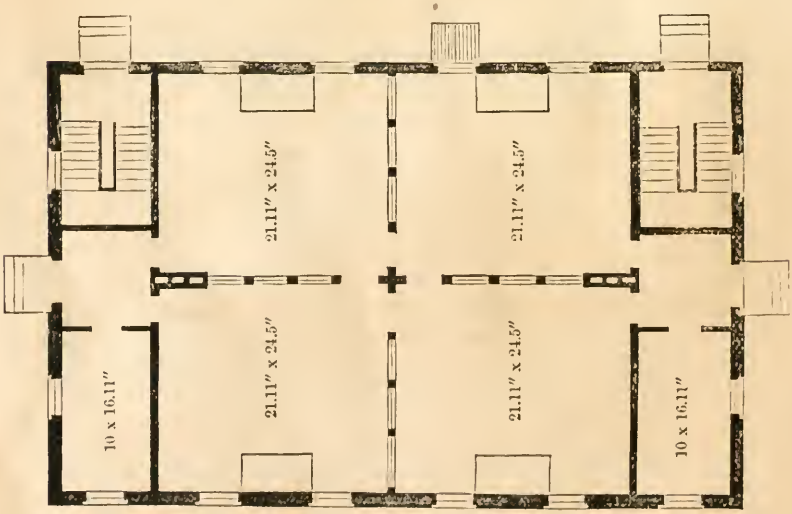
SEVENTEENTH AND WOOD STREETS.



PLAN OF FIRST FLOOR.

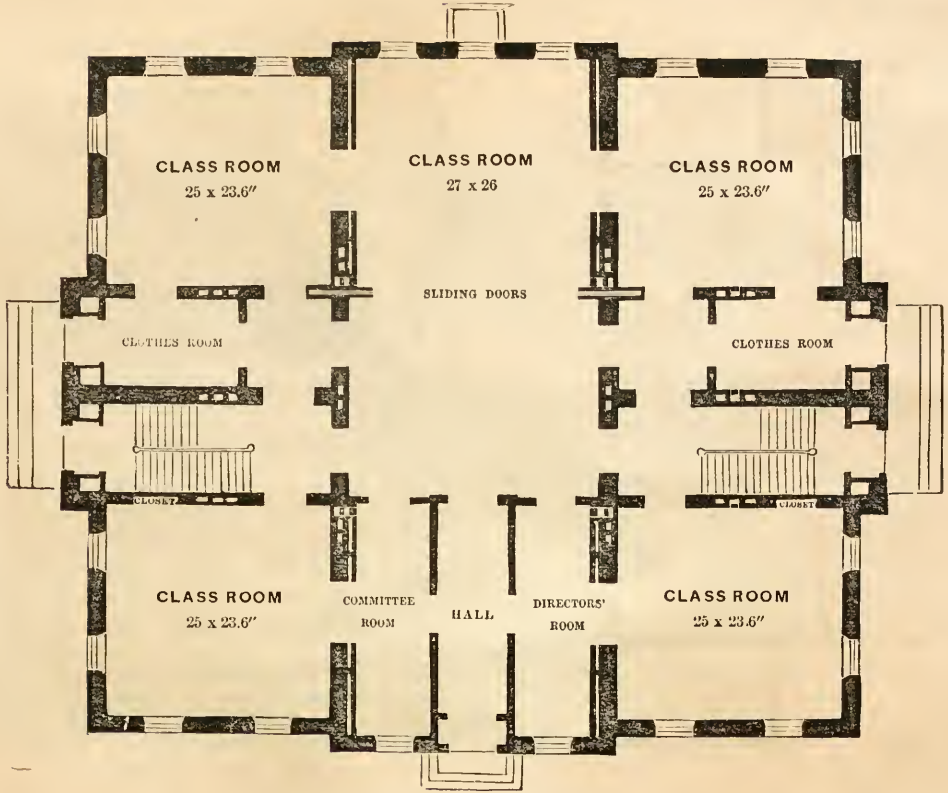
15th SECTION. SEVENTEENTH AND WOOD STS.

TWENTIETH SECTION.



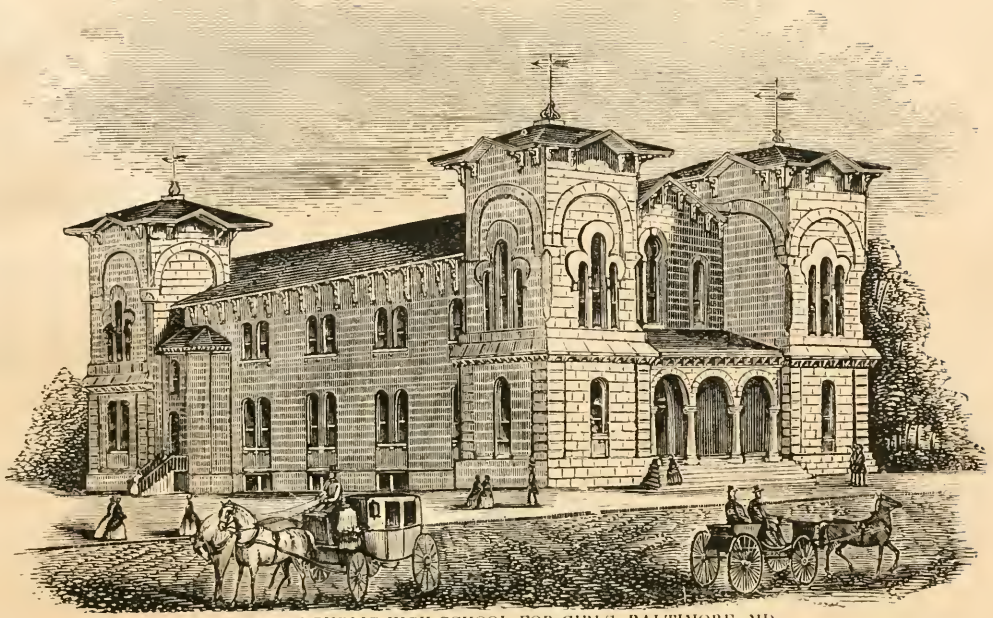
PLAN OF FIRST FLOOR.

20th SECTION.



PLAN OF FIRST FLOOR.

7th SECTION. SEVENTEENTH AND PINE STS



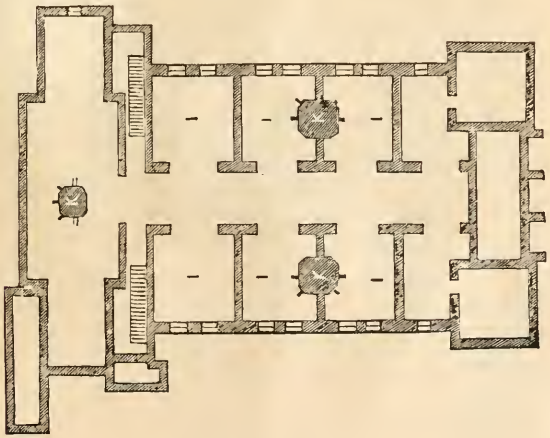
WESTERN PUBLIC HIGH SCHOOL FOR GIRLS, BALTIMORE, MD

SCHOOL ARCHITECTURE.

Plans and Description of the Western Female Public High School Building, Baltimore, Maryland.

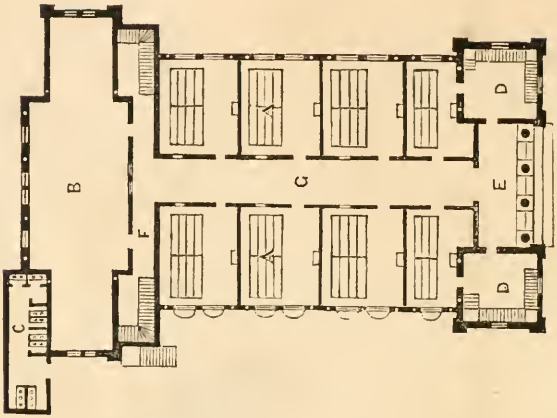
This building is located on Fayette street, about thirty feet west of Paca street. It stands on one of the highest eminences in the city of Baltimore, and has a front of seventy-seven feet, including two towers twenty-two feet square, which project four feet, each side of the main building, and a depth of one hundred and thirty-four feet. In the rear the building is eighty-eight feet, including the towers. It is capable of accommodating five to six hundred girls. The style of Architecture is Italian. There is a tower in each corner for stairways. Besides the stairways the towers will contain several rooms. They project fifteen feet from the facade of the main building, and form a Galilee or enclosed porch in front. The doors and windows are round top. Those of the towers are unequal triplets. Those of the flank are formed into couplets. The lower floor is divided into nine recitation rooms, including the chemical hall, which is twenty-four by eighty feet. The other recitation rooms are twenty-two by twenty-eight feet. The study room, which is in the second story, is one hundred and sixteen feet ten inches in length and sixty-five feet wide in the clear. Its altitude is twenty feet. There are two Female High Schools in Baltimore, the Eastern and the Western. They were organised in 1844. They have been found eminently useful in affording to young ladies the opportunity of receiving instruction in the higher branches of education. Cost of lot, $20,000; of building and furniture, $30,000.

Fig. 2. Basement and Foundation.



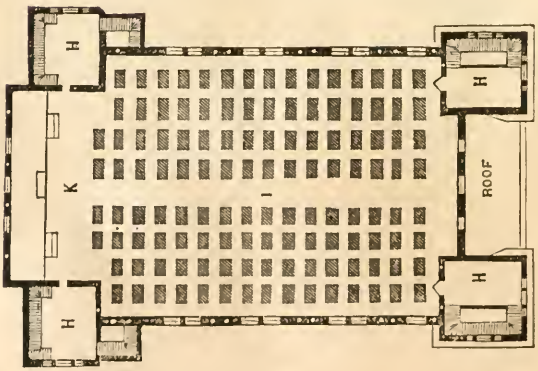
I—
K—Furnaces

Fig. 3. First Floor.



A—Recitation Rooms.
B—Chemical Lectures and Apparatus.
C—Water Closets.
D—Towers, with Stairways.
E—Arcaded Portico.
F—Passage, with Stairway.
G—Hall.
·—The small dots represent flues, for heated air, and for ventilation. Each ventilating flue is eight inches in diameter and terminates in a smoke flue on each side of the building.

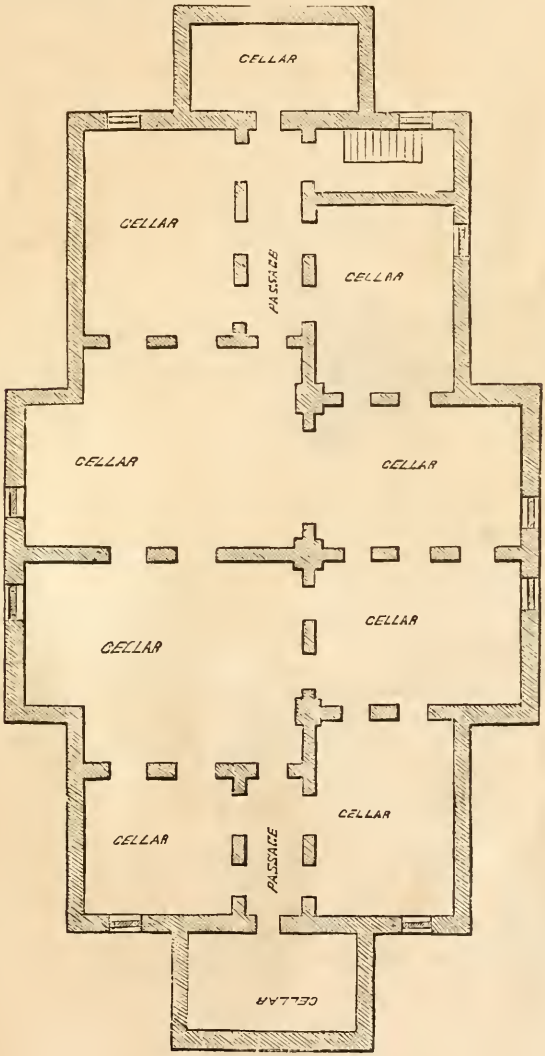
Fig. 4. Second Floor.



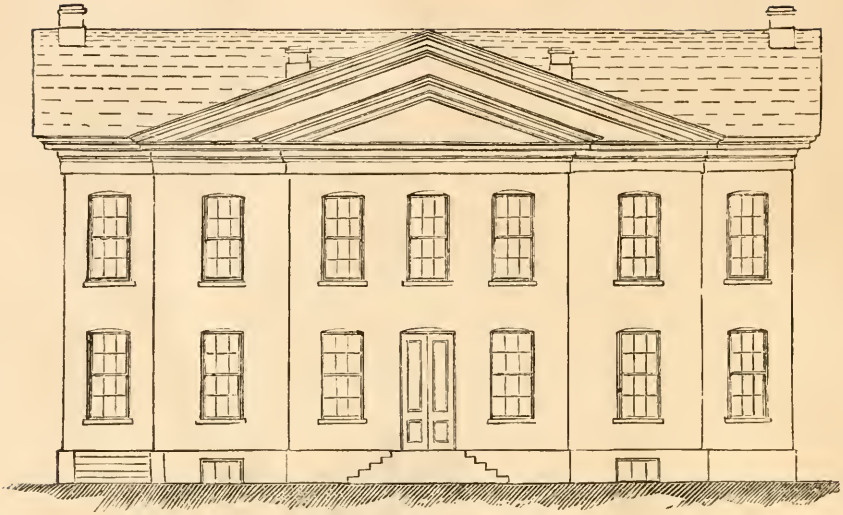
H—Towers.
I—Saloon and Lecture Room—seat 500 girls.
K—Rostrum.

PLANS OF PRIMARY AND GRAMMAR SCHOOL BUILDINGS IN BALTIMORE, MD.

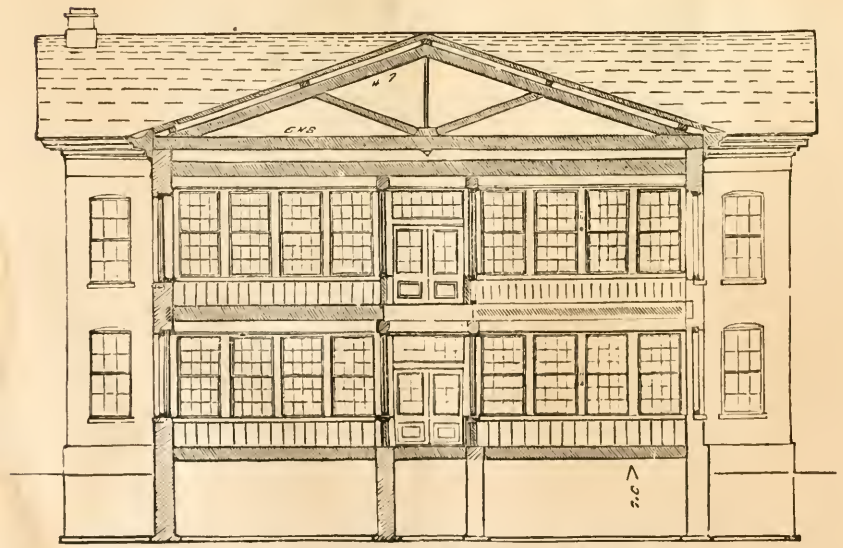
THE following plans were prepared by Mr. J. J. Husband, of the firm of Avery & Husband, Architects, Baltimore, with the assistance of the Superintendent of Public Schools, Rev. J. N. M'Jilton, D. D., under instructions from the Building Committee of the School Board in 1867.



CELLAR—GRAMMAR SCHOOL



GRAMMAR SCHOOL, BALTIMORE, MARYLAND, (Front Elevation.)

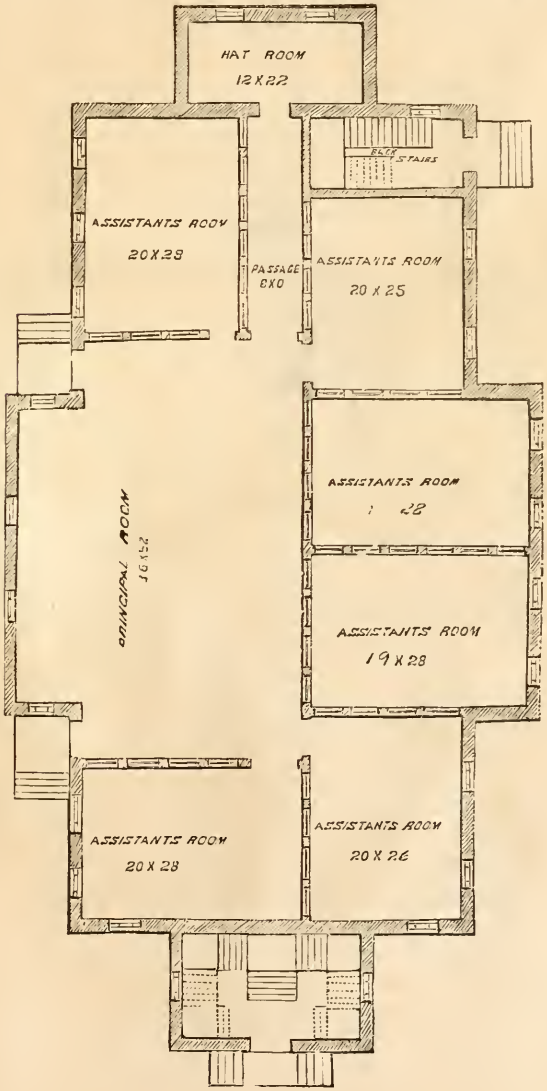


PUBLIC GRAMMAR SCHOOL, BALTIMORE, MARYLAND.

Transverse section, showing sash partitions, and framing of roof.

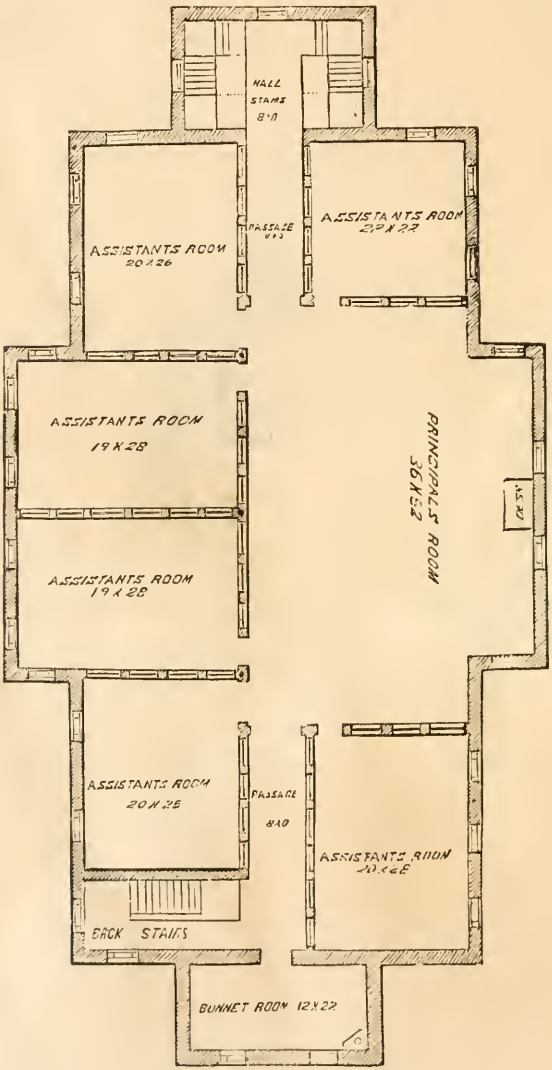
Plan for a Grammar-School.

The plan of the Grammar School shows seven school-rooms on each floor, with hat and bonnet rooms, stairways, &c. The Principal's room in each story is 36×52 feet, containing an area of 1,872 square feet, and capable of seating two hundred and fifty pupils, without interference with the aisles which lead from the apartment to the rooms of the assistant teachers. The class-rooms of assistant teachers are six in number. They are varied in their dimensions. In each of these rooms seventy or more pupils may be seated. Each floor will



First Floor—Grammar School.

afford accommodations for six hundred and seventy to seven hundred pupils. The rooms are so arranged that the Principal at his desk, or in any part of his room, can have a view through the sash partitions of all the rooms, and of all the pupils in them. The pupils may be so seated as to face the side wall at which the Principal's desk is placed, and by a slight turn of the head their faces may be directed towards the desk whenever it may be necessary. By

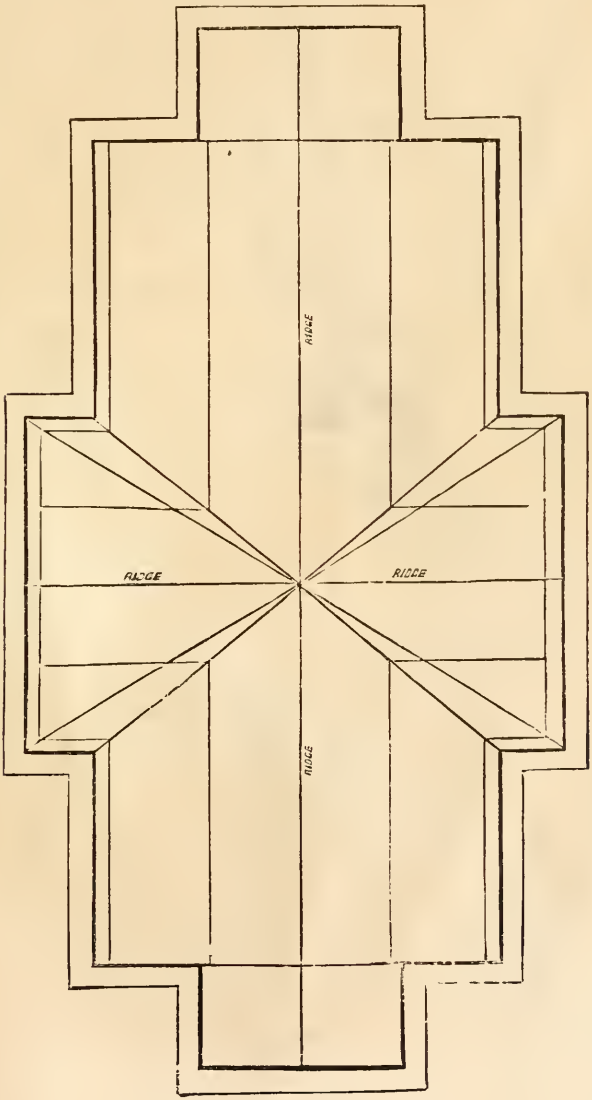


Second Story—Grammar School.

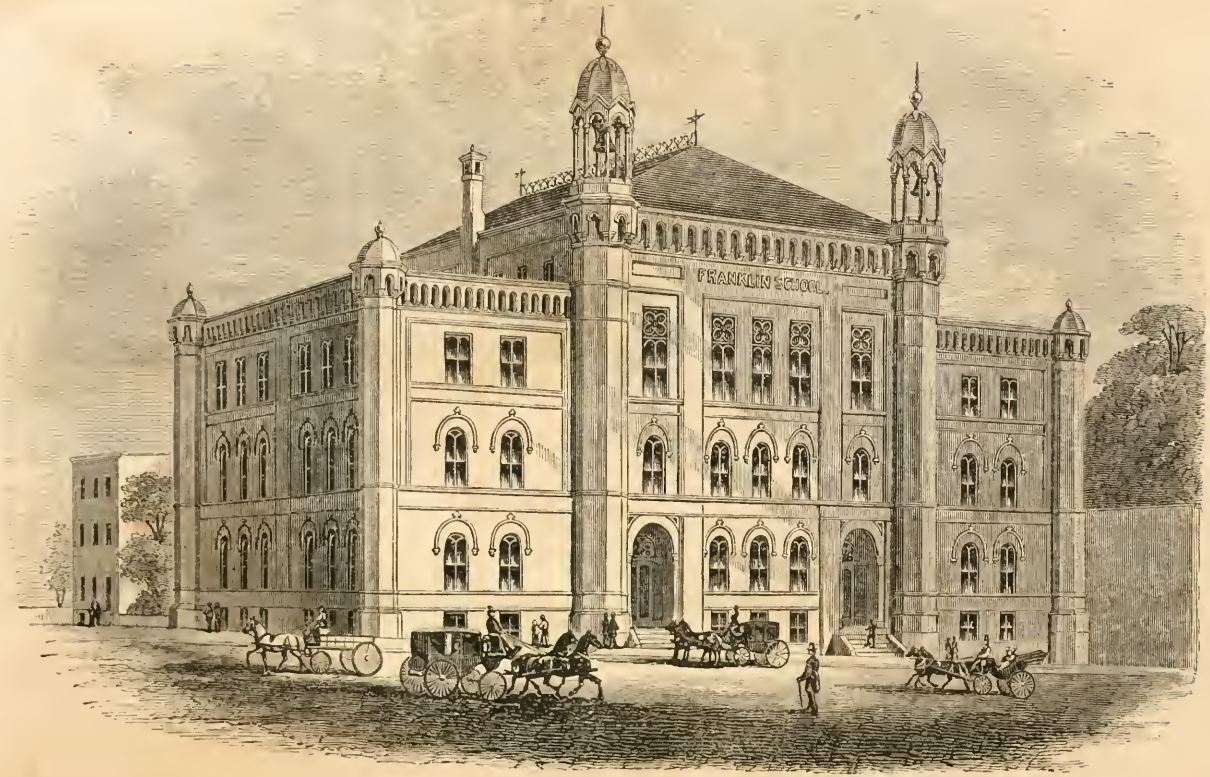
throwing up the sash of the partitions, the whole floor may be used as a single room, when addresses are to be delivered to the school, or general orders given.

There are two stairways on the plans—one near the front, the other near the rear wall, by which, whenever it becomes necessary, the pupils may be removed from the building in a few minutes.

The doors of all the rooms, and those leading from the building, open outwardly.



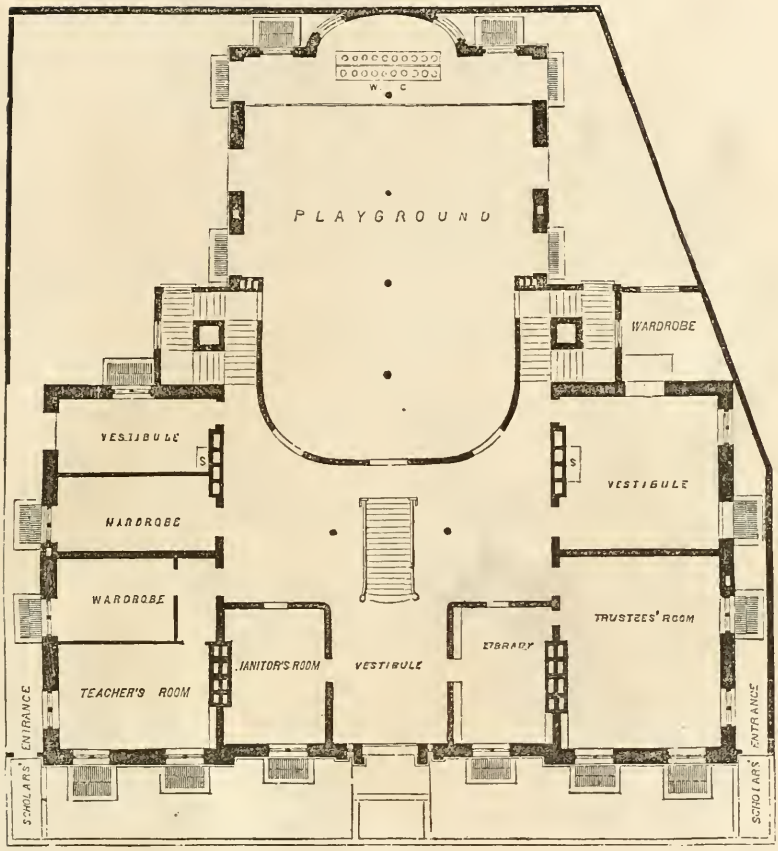
Framing of Roof—Grammar School.



FRANKLIN PUBLIC SCHOOL, WASHINGTON, D. C.

Erected in 1858. Kluss and Kunerbucher, Architects.

Fig. 2. Ground Floor.



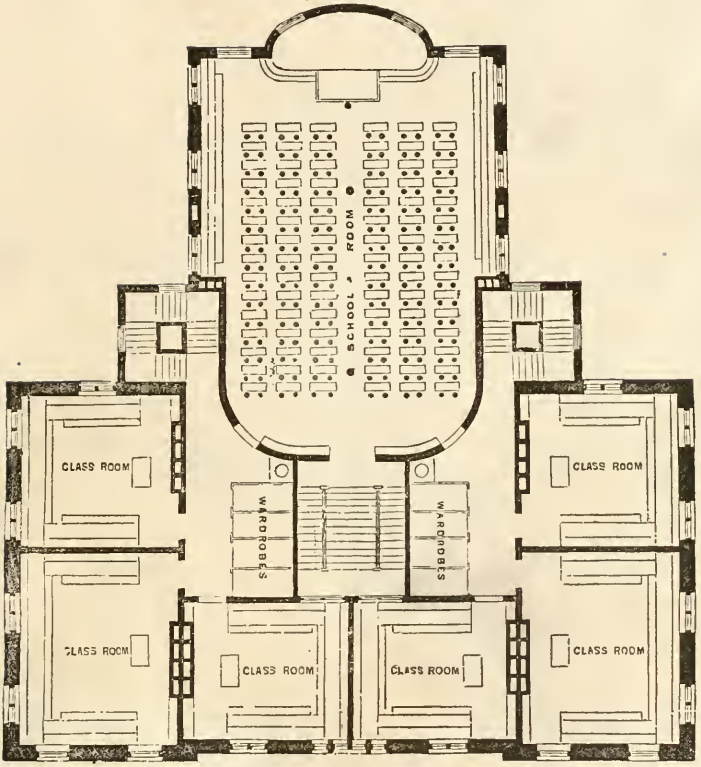
Plans of Grammar School-house, No. 47, New York City.

The elevation represents the new School-house erected in Twelfth Street, between Broadway and University Place, for a Grammar School for girls. The building has a front of 94 feet, and is 100 feet deep and 4 stories high. It is built of brick, the basement having a brown stone front, well finished, with an excellent architectural effect.

Figure No. 2, is the ground floor, chiefly occupied as the play-ground for the scholars, extending under nearly the whole building, and protected from the weather by doors and walls. In fine weather the doors being thrown open, ample room is afforded for exercise.

The lettering in the plan will enable the reader to see at once the arrangement of the rooms. At the right is the Library and the rooms for the meetings of the School Officers of the Ward. At the left are rooms for the Teachers, and the Janitor, and Wardrobes for the use of the pupils. The water-closets are at the rear part of the building.

Fig. 3. First Floor.



There is a cellar under the whole building, where fuel is stored, and the furnaces are placed. Of these there are five, constructed by Messrs. Culver, Simonds & Co., of New York.

The first story is occupied by the Primary Department, and has six class-rooms, as represented in Fig. 3, beside the large room, where the pupils assemble at the opening and close of the school. Four wardrobes are placed on each side of the stairway, where the outer clothing of the scholars are hung during school hours. The stairways, on each side of the house, afford an egress into the play-ground.

The second story, Fig. 4, is the same as the first, except that two of the class-rooms are supplied with desks for the upper classes.

The third story, represented in Fig. 5, is the same, with the exception that all the class-rooms are furnished with desks. This department is for the highest grade of scholars, and is similar, in all its arrangements with respect to wardrobes, &c., to the other departments.

The whole house is furnished with the School Furniture of Joseph L. Ross, and is very handsomely and conveniently arranged for the accommodation of the pupils.

The building was erected under the supervision of Thomas R. Jackson, architect; the mason-work being performed by Wm. B. Rhoades, and the carpenter's work by Powers & Schoonmaker.

Fig. 4. Second Floor.

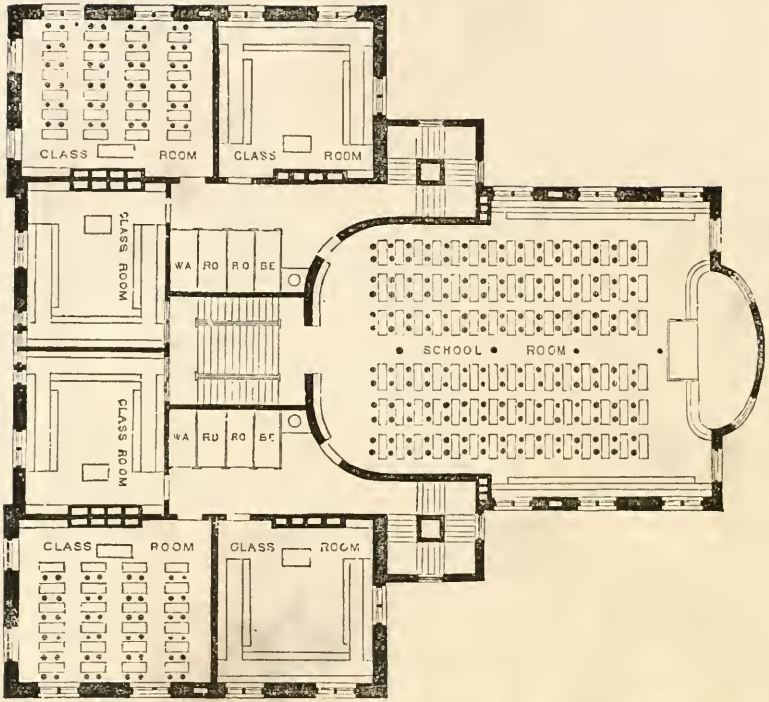
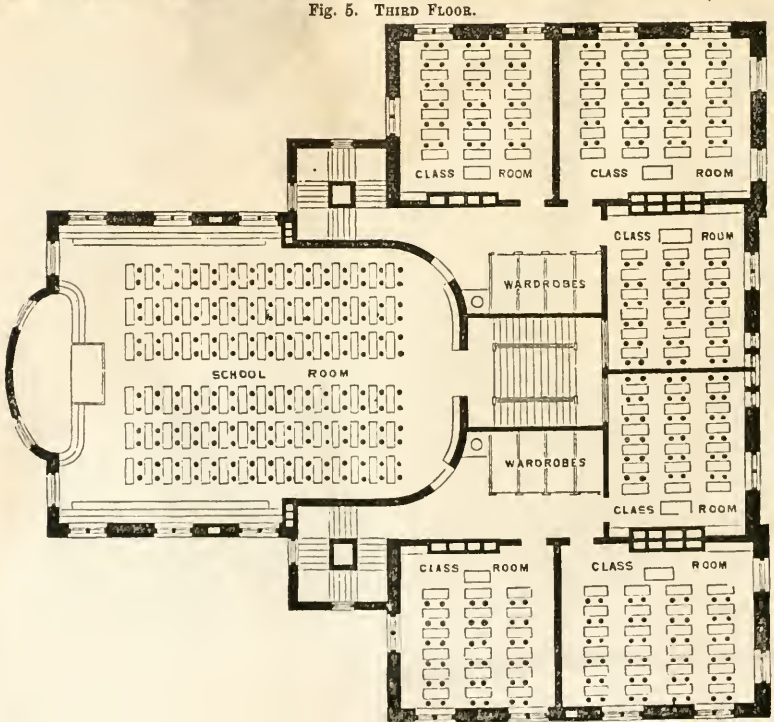


Fig. 5. Third Floor.



Plans of Public School-house Number Twenty

Public Grammar School No. 20 is located in Chrystie near Delancey street, in the Tenth Ward. The lot on which the building is situated is 100 feet square.

The main building is 50 by 97 feet, with four wings 25 by 28, and 25 by 33, which give it a frontage of 100 feet. The style of architecture of the front is Corinthian.

There is a cellar under four wings and front of the main building. The cellar is eight feet in the clear.

The basement story is ten feet in the clear, and the ceilings of the three remaining stories are fourteen feet in the clear.

The building is heated with Barrows' furnaces.

The rear stairs and platforms are constructed of stone and inclosed with brick walls, thereby rendering the stairs fire-proof.

The whole cost of the building, including the furniture and fitting up, is about $44,000.

Fig. 1.—Play-grounds, Janitor's Apartments, &c.

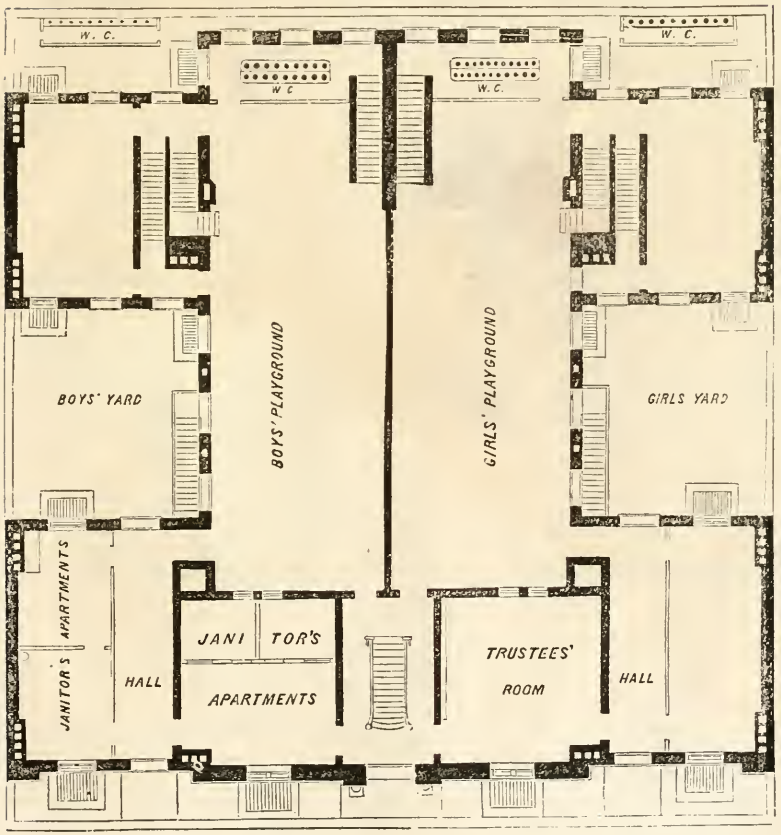


Fig. 2.—Second Floor, Primary Department.

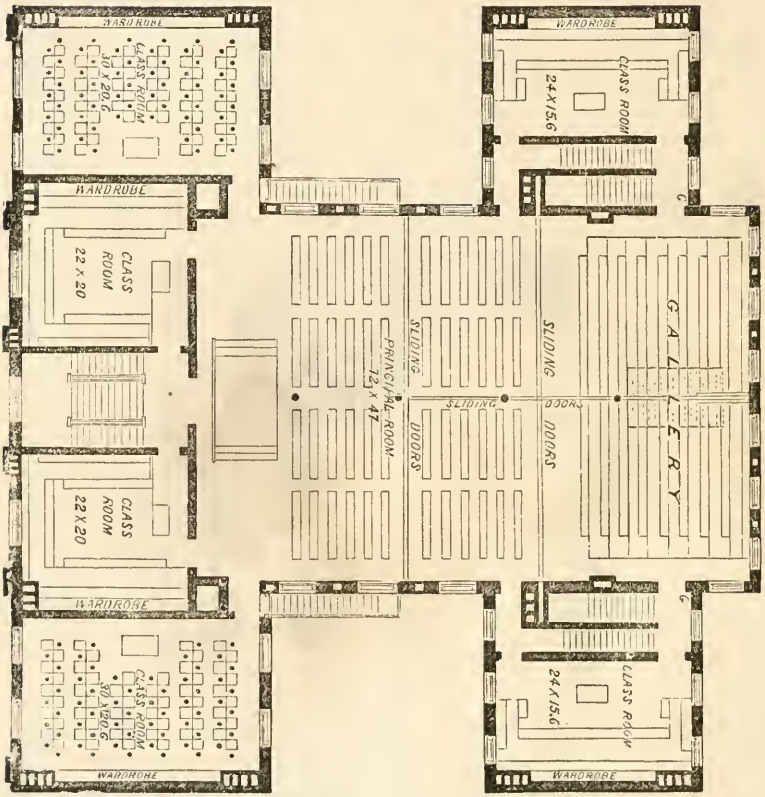
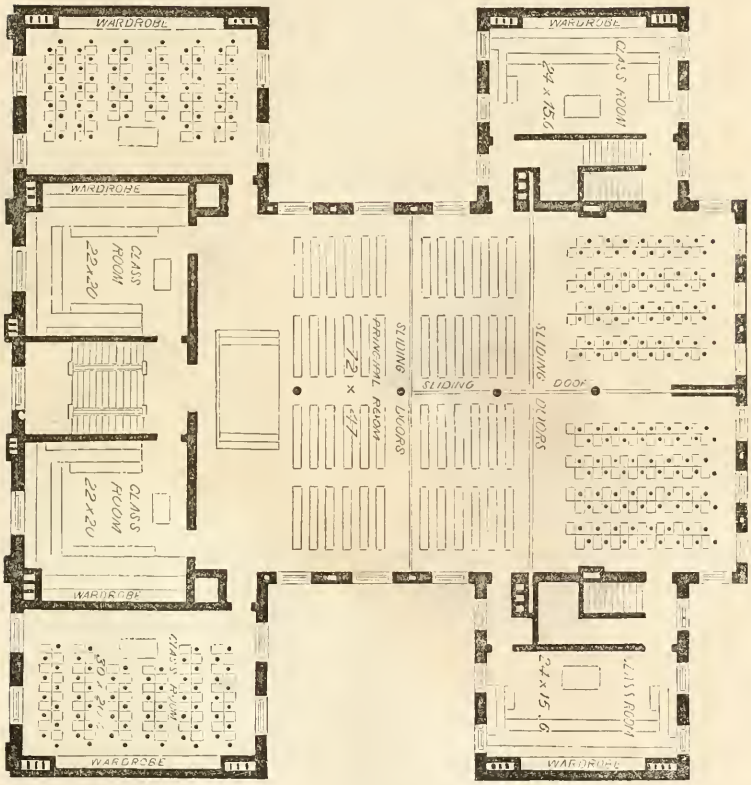
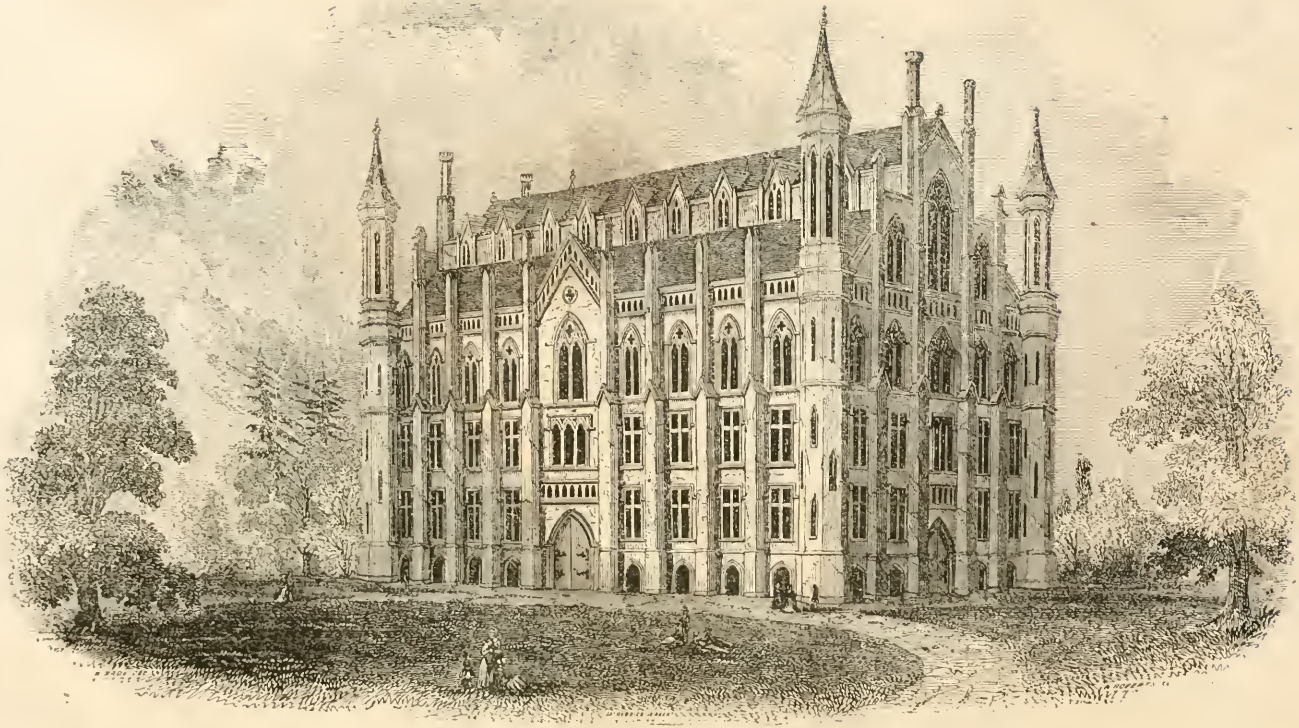


Fig. 3.—Third Floor, Female Department.





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